

ANNE ARUNDEL MEDICAL CENTER
CERTIFICATE OF NEED APPLICATION

Johns Hopkins Cardiac Surgery at Anne Arundel Medical Center

FEBRUARY 20, 2015



Table of Contents

PART I – PROJECT IDENTIFICATION AND GENERAL INFORMATION.....	4
Comprehensive Project Description	12
PART II – PROJECT BUDGET	25
PART III – APPLICANT HISTORY, STATEMENT OF RESPONSIBILITY, AUTHORIZATION AND RELEASE OF INFORMATION, AND SIGNATURE	26
PART IV – CONSISTENCY WITH GENERAL REVIEW CRITERIA AT COMAR 10.24.01.08G(3)	31
10.24.01.08G(3)(a). State Health Plan Services	31
COMAR 10.20.10 – Acute Hospital Services	31
.04 Standards	32
A. General Standards.....	32
(1) Information Regarding Charges.....	33
(2) Charity Care Policy.....	34
(3) Quality of Care.....	36
B. Project Review Standards	38
(1) Geographic Accessibility	39
(2) Identification of Bed Need and Addition of Beds	40
(3) Minimum ADC for Establishment of Pediatric Unit.....	41
(4) Adverse Impact	42
(5) Cost Effectiveness	43
(6) Burden of Proof Regarding Need	47
(7) Construction Cost of Hospital Space.....	48
(8) Construction Cost of Non-Hospital Space	49
(9) Inpatient Nursing Unit Space.....	50
(10) Rate Reduction Agreement	51
(11) Efficiency	52
(12) Patient Safety	54
(13) Financial Feasibility	59
(14) Emergency Department Treatment Capacity and Space.....	65
(15) Emergency Department Expansion	66
(16) Shell Space	67
COMAR 10.24.17 – Cardiac Surgery Standards	68
.04 Commission Program Policies	68
(b) Population-Based Budget Agreement	69
(c) Existing PCI Intervention Program	70
(d) Most Recently Approved Program	75
.05 Certificate of Need Review Standards for Cardiac Surgery Programs	76
(1) Minimum Volume	77

(2)	Impact	87
(3)	Quality	99
(4)	Cost Effectiveness	108
(5)	Access	110
(6)	Need.....	129
(7)	Financial Feasibility	160
(8)	Preference in Comparative Review	165
	10.24.01.08G(3)(b) - Need.....	204
	10.24.01.08G(3)(c) – Availability of More Cost Effective Alternatives	207
	10.24.01.08G(3)(d) – Viability of Proposal	209
	10.24.01.08G(3)(e) – Compliance with Conditions of Previous Certificates of Need.....	215
	10.24.01.08G(3)(f) – Impact on Existing Providers	216

PART I – PROJECT IDENTIFICATION AND GENERAL INFORMATION

MARYLAND

HEALTH

MATTER/DOCKET NO.

CARE

COMMISSION

DATE DOCKETED

HOSPITAL

APPLICATION FOR CERTIFICATE OF NEED

PART I - PROJECT IDENTIFICATION AND GENERAL INFORMATION

1. FACILITY

Name of Facility: Anne Arundel Medical Center

Address:

<u>2001 Medical Parkway</u>	<u>Annapolis</u>	<u>21401</u>	<u>Anne Arundel</u>
Street	City	Zip	County

Name of Owner (if differs from applicant):

2. OWNER

Name of owner: Anne Arundel Health System, Inc.

3. APPLICANT. *If the application has co-applicants, provide the detail regarding each co-*

applicant in sections 3, 4, and 5 as an attachment.

Legal Name of Project Applicant
Anne Arundel Medical Center, Inc.

Address:

2001 Medical Parkway	Annapolis	21401	MD	Anne Arundel
Street	City	Zip	State	County

Telephone: (443) 481-1000

Name of Owner/Chief Executive: Victoria W. Bayless, President and Chief Executive Officer

4. NAME OF LICENSEE OR PROPOSED LICENSEE, if different from applicant:

5. LEGAL STRUCTURE OF APPLICANT (and LICENSEE, if different from applicant).

Check or fill in applicable information below and attach an organizational chart showing the owners of applicant (and licensee, if different).

- A. Governmental
- B. Corporation
- (1) Non-profit
- (2) For-profit
- (3) Close
- State & date of incorporation
Maryland - 1902
- C. Partnership
- General
- Limited
- Limited liability partnership
- Limited liability limited partnership
- Other (Specify): _____
- D. Limited Liability Company
- E. Other (Specify): _____
- To be formed:
- Existing:

6. PERSON(S) TO WHOM QUESTIONS REGARDING THIS APPLICATION SHOULD BE DIRECTED

A. Lead or primary contact:

Name and Title: Paula S. Widerlite, Chief Strategy Officer

Mailing Address: _____

<u>2001 Medical Parkway</u>	<u>Annapolis</u>	<u>21401</u>	<u>MD</u>
Street	City	Zip	State

Telephone: (443) 481-1340

E-mail Address (required): pwiderlite@aaahs.org

Fax: _____

B. Additional or alternate contact:

Name and Title: Jonathan Montgomery, Esq

Mailing Address:

233 East Redwood Street

Baltimore

MD

21202

Street

City

Zip

State

Telephone: (410) 576-4088

E-mail Address (required): jmontgomery@gflaw.com

Fax: (410) 576-4032

7. TYPE OF PROJECT

The following list includes all project categories that require a CON under Maryland law. Please mark all that apply.

If approved, this CON would result in:

- (1) A new health care facility built, developed, or established
- (2) An existing health care facility moved to another site
- (3) A change in the bed capacity of a health care facility
- (4) A change in the type or scope of any health care service offered by a health care facility
- (5) A health care facility making a capital expenditure that exceeds the current threshold for capital expenditures found at:
http://mhcc.maryland.gov/mhcc/pages/hcfs/hcfs_con/documents/con_capital_threshold_20140301.pdf

8. PROJECT DESCRIPTION

A. Executive Summary of the Project: The purpose of this BRIEF executive summary is to convey to the reader a holistic understanding of the proposed project: what it is; why you need/want to do it; and what it will cost. A one-page response will suffice. Please include:

- (1) Brief description of the project – what the applicant proposes to do;
- (2) Rationale for the project – the need and/or business case for the proposed project;
- (3) Cost – the total cost of implementing the proposed project; and
- (4) Master Facility Plans – how the proposed project fits in long term plans.

Brief Description: Anne Arundel Medical Center, Inc. (AAMC), a regional health system headquartered in Annapolis, Maryland, proposes to develop a cardiac surgery, research and training program in partnership with Johns Hopkins Medicine (JHM). AAMC is a center of excellence for cardiology and vascular services, including screening and preventive programs, medical management of cardiac disease, diagnostic and interventional procedures, and endovascular procedures. Its ability to provide a continuum of basic through advanced cardiac services for the population it serves is compromised by its restriction from offering cardiac surgery. A cardiac surgery program is necessary to improve safe access to a full range of care for its patients with heart disease. It is a logical step in creating an integrated program of cardiac care for a large population that otherwise finds the vast majority of its medical and surgical needs met by AAMC. Development of the program with the support and expertise of JHM's recognized cardiac surgery team will ensure top quality from its inception, and with AAMC's proven record of high quality / low cost care, it will also be among the least expensive and result in a \$2M positive impact on the Medicare Waiver Test.

Rationale: AAMC serves a population of approximately 1.1 million and its service area is the largest region in Maryland without a cardiac surgery program. AAMC must transfer more than 200 patients each year for cardiac surgical care, a number in excess of the minimum requirement for a program. Distances to the nearest hospitals with cardiac surgery programs also translate to access delays of up to an hour or more, a significant burden on patients and a serious risk factor when emergency needs arise. The net result is a fragmented approach to cardiac care that fails to meet any tenet of the Institute for Healthcare Improvement (IHI) / Center for Medicare and Medicaid Service (CMS) Triple Aim: better patient experience, better population health, and lower cost per case. AAMC has the capability to incorporate cardiac surgery into a fully integrated cardiac care program. It will offer high quality cardiology services and interventional procedures, a dedicated operating room, and bed capacity. It will require little modification, and will have one of the most affordable hospital charge structures in the state.

Cost: The total on-site construction and equipment costs are projected to be approximately \$2,500,000.

Master Facility Plan: AAMC has the infrastructure – facilities and space – to provide cardiac surgery. The Master Facility Plan has included capacity for cardiac surgery, from ambulatory care through operative care to critical care and rehabilitation and added 30 new inpatient rooms. The new operating room (OR) area, which opened in 2011, includes already constructed large surgical suites which will be adapted for cardiac surgery. These ORs are in direct proximity to AAMC's busy cardiac catheterization laboratories. In addition, the surgical

intensive care unit (SICU), which opened in 2014, has capacity for post-op cardiac surgery patients. These facilities are already in place and will not require expensive additions.

AAMC's Master Facility Plan already foresees expansions strengthening AAMC's ability to handle an increase in cardiac patient volume, including a new catheterization lab, which is currently under construction and will open in 2015.

B. Comprehensive Project Description: The description must include details, as applicable, regarding:

- (1) Construction, renovation, and demolition plans;

RESPONSE:

AAMC will make minor modifications to two operating rooms¹ to optimize their use as CVORs.

Modifications to the two ORs are as follows:

Architectural

- Remove and reinstall drywall ceilings
- Patch and repair drywall walls
- Repair terrazzo floors and integral wall protection

Mechanical, Electrical & Plumbing

- Install electrical conduit and wiring as needed
- Install conduits to support audio/video devices
- Adjust mechanical and plumbing systems to accommodate additional ceiling mounted supports

Structural

- Install structural supports for articulating anesthesia column and additional booms

Specialty Systems

- Modify anesthesia columns from fixed to articulating

¹The two operating rooms - referred to as OR 15 and OR 16 - are located on the 2nd floor of AAMC's South Tower. Both ORs are appropriately sized for use as CVORs at 608 and 631 square feet respectively. The operating rooms have a storage room placed between them.

- Upgrade audio/video integration hardware to include additional fixed and movable video monitors
- Expand synchronized atomic clock system
- Add additional ceiling mounted surgical lights and supporting hardware for video monitors
- Add ceiling mounted Perfusionists boom

Modifications to Surgical Intensive Care Rooms are as follows:

- Install mounting support for wall mounted exam light
- Patch and paint affected wall area
- Install wall mounted exam light

Storage space for perfusion and other ancillary supplies are within close proximity to the proposed surgical suites and no modifications are needed.

Two Surgical Intensive Care rooms will be assigned to cardiac patients. Other than installation of new exam lights, no other modifications are needed to these two rooms.

No modifications are needed to the existing trauma elevator.

- (2) Changes in square footage of departments and units;

Response

Square footage of the surgical department will remain unchanged.

Square footage of the surgical intensive care unit (SICU) will remain unchanged.

Square footage of the Heart and Vascular Unit will remain unchanged.

- (3) Physical plant or location changes;

None.

- (4) Changes to affected services following completion of the project; and

None.

- (5) If the project is a multi-phase project, describe the work that will be done in each phase. If the phases will be constructed under more than one construction contract, describe the phases and work that will be done under each contract.

Response:

AAMC plans to complete the project's construction in a single phase, given the minor nature of the construction activity.

All modifications noted in section 8.B(1) will be performed via multiple contracting avenues (contracts, purchase orders, etc.).

A construction manager/general contractor (CM/GC) will be selected to perform all architectural, mechanical, electrical, plumbing and structural implications. Overall construction coordination and infection control measures will be under the purview of the CM/GC.

Berchtold, an AAMC contractor, will be providing services to modify the fixed anesthesia columns as well as provide, install and integrate new ceiling-mounted surgical lights and associated hardware.

Stryker, another contractor, will be integrating any new audio/video devices.

Comprehensive Project Description

Anne Arundel Medical Center, Inc. (AAMC), a regional health system headquartered in Annapolis, Maryland, proposes to develop a cardiac surgery, research and training program in partnership with Johns Hopkins Medicine (JHM). AAMC is a center of excellence for cardiology and vascular services, including screening and preventive programs, medical management of cardiac disease, diagnostic and interventional procedures, and endovascular procedures. Its ability to provide a continuum of basic through advanced cardiac services for the population it serves is compromised by its restriction from offering cardiac surgery. A cardiac surgery program is necessary to improve safe access to a full range of care for its patients with heart disease. It is a logical step in creating an integrated program of cardiac care for a large population that otherwise finds the vast majority of its medical and surgical needs met by AAMC. Development of the program with the support and expertise of JHM's recognized cardiac surgery team will ensure top quality from its inception, and with AAMC's proven record of high quality / low cost care, it also will be among the least expensive and result in a \$2M positive impact on the Medicare Waiver Test.

Overview of AAMC

AAMC includes a 384-bed, not-for-profit, acute care hospital nationally recognized in quality for joint replacement, emergency heart attack response and cancer care. It is the third busiest hospital in Maryland (measured by patient volume). A leader in women's services, AAMC ranks second among Maryland hospitals for the number of deliveries and has a Level III+ neonatal

intensive care unit, providing the highest level of NICU care for premature and seriously ill newborns.

Anne Arundel Medical Center was founded in 1902 and remains part of an independent health system located in Annapolis, Maryland. The strategic vision of the organization, “living healthier together” was defined in 2010 and reoriented what was a successful hospital into a regional health system. Creating a sustainable ambulatory care platform, delivering high quality care at low cost and broadening the breadth and depth of clinical program supported this effort. Now the third busiest acute care facility in Maryland, AAMC is seeking opportunities to enhance and deliver a full and integrated continuum of cardiac care to the region.

Other services of AAMC include a multi-specialty medical group of 300 clinicians in 40+ locations throughout the region, an accountable care organization (ACO) participating in the Medicare Shared Savings Program, mental health and substance use treatment facilities, unregulated imaging centers, lab services, a clinical research institute, and a simulation and innovation center.

The State of Maryland, having signed a waiver with CMS, has committed health systems to orient towards population health as opposed to volume based, transactional care. AAMC has signed an agreement setting a Global Based Revenue amount with the Maryland Health Services Cost Review Commission (HSCRC). This is driving Maryland health systems to develop care in lower cost environments. Therefore, offering a full and integrated continuum of cardiac services is consistent with this objective.

Under its Global Budget Revenue (GBR) contract, AAMC is responsible for a defined service area of approximately 1.1 million residents. The service area includes Anne Arundel County and communities in seven other counties including Calvert, Prince George’s, Charles, Caroline, Talbot, Kent, and Queen Anne’s counties.

AAMC is one of Anne Arundel County’s largest employers with more than 4,000 employees. Also committed to AAMC are 1,000 Medical Staff members and nearly 700 volunteers. A major charitable resource to the region it serves, AAMC contributed \$36 million in community benefit in FY 2014, including subsidized programs and charity care, community outreach, health education, and research activities. The medical center annually attracts millions of dollars in private support through its foundation, a testament to the high regard in which AAMC is held by its community.

Overview of Johns Hopkins Medicine

Established as an internationally recognized state-of-the-art hospital in 1889, The Johns Hopkins Hospital, (JHH), the flagship hospital of JHM, has been recognized for its outstanding clinical care throughout its history. The Johns Hopkins Hospital has been ranked number one in the nation by U.S. News & World Report for 22 years of the survey's 25-year history, most recently in 2013. JHH offers all acute care services generally provided to hospital patients, as well as services in virtually every clinical subspecialty. The Hospital operates 19 major clinical departments, including Anesthesiology/Critical Care Medicine, Dermatology, Emergency Medicine, Gynecology/Obstetrics, Medicine, Neurology and Neurosurgery, Oncology and Radiation Oncology, Ophthalmology, Orthopedics, Otolaryngology-Head and Neck Surgery, Pathology, Pediatrics, Physical Medicine and Rehabilitation, Plastic Surgery, Psychiatry, Surgery, and Urology.

JHH maintains many nationally and internationally known specialized centers for patient care and research. Among these centers is the Johns Hopkins Heart and Vascular Institute, where specialists in every branch of cardiac care work collaboratively to develop innovative treatments and advance the science of cardiac care. Other specialized centers include the following: the Wilmer Eye Institute, designated as the State's only eye trauma center; the Clayton Heart Center; The Kimmel Comprehensive Cancer Center, a National Cancer Institute designated Comprehensive Cancer Center (the only one in Maryland and one of only 31 designated nationally); the Children's Center, which is a designated Pediatric Trauma Unit for the State of Maryland; the Sickle Cell Infusion Center, an outpatient clinic dedicated to sickle cell patients that is open seven days per week; the Brady Urological Institute; the Meyerhoff Center for Digestive Diseases; and both inpatient and outpatient facilities for the treatment of patients with Acquired Immuno-Deficiency Syndrome. Further, the Hospital operates a Comprehensive Transplant Center, offering heart, lung, kidney, pancreas, liver, vascular composite allograft, cornea, and bone marrow transplant programs.

JHH is also distinct among Maryland hospitals in terms of the scope and nature of the medical education it provides. As one of the largest medical teaching institutions in the world, JHH serves as the primary medical training environment for over 2,000 residents and fellows and nearly 600 Johns Hopkins University School of Medicine (JHUSOM) medical students annually. JHUSOM's teaching activities at JHH are extensive, including medical resident and student fellowship training in almost every specialty. Johns Hopkins University also trains nurses, radiology technicians and other health care professionals.

In addition, JHM has founded the Johns Hopkins Center to Eliminate Cardiovascular Health Disparities (JHCHD) a collaboration among the Bloomberg School of Public Health, the School of Medicine, the School of Nursing and Johns Hopkins Community Physicians.

Partnership with Johns Hopkins Medicine

In 2007, AAMC and JHM entered into a relationship in recognition of their mutual commitment to patient-centered care and improved access to the highest quality, affordable, health care in the region. As part of this ongoing alliance, AAMC will partner with JHM to bring renowned cardiac surgeons to AAMC to establish its cardiac surgery program.

JHM surgeons will bring expertise in traditional cardiac surgery, as well as the latest innovations in minimally invasive valve repair and replacement surgery. JHM already has been actively involved in the clinical development and planning process for a cardiac surgery program at AAMC. This partnership will continue with JHM's participation in the cardiac surgery service line management, including management of program policies, protocols, procedures, operating and capital budgets, staffing, equipment and supplies, strategic planning, and marketing. JHM surgeons, in conjunction with AAMC cardiologists, will also partner in quality improvement initiatives, including Society of Thoracic Surgeons (STS) database participation.

AAMC Leadership in Cardiac Care

AAMC is a Cardiac Interventional Center designated by the Maryland Institute of Emergency Medical Services Systems, and a Chest Pain Center with Percutaneous Coronary Intervention (PCI) designated by the Society of Cardiovascular Patient Care. AAMC is also the recipient of the Gold Performance Achievement Award from the American College of Cardiology. AAMC adheres to nationally recognized standards for cardiac care, working with a team of dedicated interventional cardiologists, nurses and technologists trained in rapid response and treatment of myocardial infarction (MI).

AAMC has demonstrated excellence in its delivery of cardiac care through its interventional Cardiovascular Patient Outcomes Research Team (CPORT) and Cardiovascular Patient Outcomes Research Team Elective (CPORT-E) programs. The CPORT program at AAMC, providing angioplasty for acute MI, has some of the highest volumes and best outcomes in Maryland, with exemplary door to balloon times, excellent results and outstanding quality of care. More than 160 patients with acute MI's were treated with emergency cardiac catheterization and PCI procedures at AAMC in 2014. In addition, the cardiac catheterization laboratories at AAMC perform more than 1,000 cardiac catheterization procedures and over 240 elective PCI procedures per year.

Recognition for Leadership

AAMC has been honored for its innovative programs and their positive impact on patient care. The hospital received the prestigious Magnet recognition from the American Nursing Credentialing Center in 2014 for its commitment to quality care and patient outcomes. Nationally, only 401 hospitals out of 5,700 organizations have Magnet status. AAMC's Patient-

and Family-Centered Care model, which aims at engaging patients and families as partners in healthcare delivery, serves as a national model of excellence, and was recently recognized by the Caregiver Action Network in its report on national best practices in patient and family caregiver engagement. Other notable achievements for AAMC include:

- Received 2014 AACC Innovator Award from the Association of Community Cancer Centers for AAMC's Geaton and JoAnn DeCesaris Cancer Institute. Only six cancer programs nationwide received this honor.
- Designated Primary Stroke Center from the Joint Commission, demonstrating AAMC's stroke program follows national standards and guidelines to improve outcomes for stroke patients.
- Earned 2014 Delmarva Foundation Excellence Award for quality improvement efforts.
- Honored on the national "Most Wired" hospitals and health systems list for a fifth time by *Hospitals & Health Networks*. This recognizes AAMC for its use of technologies, such as electronic medical record tools that assist physicians, nurses, and patients in communicating efficiently.
- Achieved status of Level Facility 1 for the Weight Loss & Metabolic Surgery Program at AAMC in less than two years from opening, nationally accredited by the American College of Surgeons for providing high quality care and excellent outcomes. The Level 1 designation means AAMC is a high volume center; it is the highest volume center in Maryland, having performed 400 bariatric surgery operations in CY 2014.
- Named a *Consumer Reports* Top 10 Hospital for Surgical Safety.
- Recognized as a 2012 Leapfrog Top Hospital.
- Earned national recognition for Pathways, an AAMC affiliate, from Optum for delivering highly effective, low-cost inpatient substance abuse care.
- Received HealthStream Award for Highest Communication Perception of Quality
- Named *Becker Hospital Review's* Top 50 Greenest U.S. Hospitals.
- Awarded American Heart Association Gold-Level Fit-Friendly Worksite for implementing programs to help employees eat better and remain more active.

Defining the Need

The Cardiac Services State Health Plan maintains that "[g]eographic access to cardiac surgery services is not a problem in Maryland." This only takes into consideration the single event of an electively-timed admission for the surgical procedure itself, for which a travel time of an hour or more is inconvenient but not unsafe. The limited scope of this assessment is inconsistent with the Triple Aim of the Institute for Healthcare Improvement (IHI) and the Centers for Medicare and Medicaid Services (CMS): improved patient care experience, improved population health, and reduced per capita expenditures. Patients in need of cardiac surgery have significant disease, and

are at risk for acute decompensation and arrhythmias. Patients require accurate diagnostic studies and interpretation, expert medical management and optimization for surgery, ready availability of emergency cardiology services and, at times, emergency surgical intervention. Post-operative complications occur as well, and require access to care from the team that performed the surgery. The current approach is discontinuous, splitting a patient's care among several physicians and two or more hospitals. Emergencies often require transfers from the patient's closest hospital to one that offers cardiac surgery, delaying definitive care, adding risk, and sometimes requiring interim procedures such as aortic balloon pumps to help support survival during transport.

The logical solution is to make the full range of cardiac care, including cardiac surgery, available through one team at one facility within a safe travel time. Regardless of the degree or stage of disease, this model serves all of a patient's needs rapidly and safely. It meets the goal of improved population health and vastly improves the patient experience.

Scope of the Problem

Anne Arundel County is the largest county in Maryland (pop. 550,000+) without a cardiac surgery program. AAMC's role in the greater region is particularly significant. Its responsibility extends to communities in neighboring eastern shore counties that are even more isolated from cardiac surgery providers. In CY 2013, AAMC served more than 20% of all inpatient adult percutaneous coronary intervention (PCI) cases from the neighboring Eastern Shore counties of Talbot, Caroline, Kent, and Queen Anne's (32 out of 139 cases).

The number of cardiac surgery patients in the Anne Arundel region is significant. In CY 2013, more than 500 adults travelled from Anne Arundel County to hospitals in Washington, DC and across Maryland for cardiac surgery. Nearly 200 patients from the neighboring Eastern Shore counties of Talbot, Caroline, Kent, and Queen Anne's traveled 45-70 miles to hospitals in Baltimore City, Baltimore County, Montgomery County, Worcester County, and Washington, D.C. for cardiac surgery. However, most of their cardiology and emergency care must be provided by a different team of physicians and facilities closer to their homes and within AAMC's service region, resulting in disruption of what should be an integrated and continuous system of care.

Of even greater concern is the significant number of patients who are treated at AAMC and have to be transferred to other hospitals when it is determined that they need cardiac surgery. In FY 2014, more than 200 patients at AAMC had to be transferred to another hospital for cardiac surgery or immediate evaluation for cardiac surgery. These are acutely ill patients who can't be discharged and referred to a cardiac surgeon. In contrast to the position stated in the Cardiac Services State Health Plan, this transfer delay is problematic and disruptive to their care, and

creates unnecessary risk for these patients. A cardiac surgery program at AAMC will eliminate the need for the majority of these transfers.

A cardiac surgery program at AAMC will allow cardiologists and cardiac surgeons to communicate more directly and immediately, coordinate care transitions more safely and efficiently, and integrate decision-making as a unified clinical team with patients and their families. The program will produce a seamless experience for patients, minimize confusion and duplication, relieve patients and their families of long travel times to another hospital for follow up care, and assure continuity of care for patients who have established relationships with clinicians at AAMC.

High Performance Cardiology at AAMC

AAMC offers echocardiography, cardiac computed tomography (CT), coronary angiography, diagnostic and interventional (PCI) cardiac catheterizations, electrophysiology (EP), surgical and non-surgical vascular procedures, and cardiac rehabilitation. In FY 2014, AAMC cared for 3,000 inpatient cardiac cases and 17,000 outpatient cardiac visits. There were more than 500 EP procedures performed, more than 2,700 admissions to AAMC's Heart and Vascular Unit, and nearly 39,000 cardiac-related diagnostic tests performed.

As noted, the CPORT PCI program at AAMC has saved more than 1,000 lives in the past 10 years. Working in partnership with area Emergency Medical Services (EMS), AAMC has dramatically cut response times for emergency coronary intervention to less than 90 minutes 96% of the time, and less than 60 minutes 63% of the time in 2014.

AAMC's elective cardiac catheterization program offers interventional treatment for people with stable coronary artery disease. Since 2010, interventional cardiologists have performed nearly 700 elective angioplasty procedures. (See Exhibit 4 for clinical professionals' curriculum vitae.)

The Proposed Program

AAMC proposes to develop a comprehensive cardiac surgery program in partnership with JHM cardiac surgeons to complement its current range of cardiac services and offer patients a continuum of cardiac care. A cardiac surgery program will allow AAMC to provide a full and integrated continuum of care to patients with severe operable forms of heart disease who are not candidates for other invasive and interventional procedures.

The service area defined for the proposed program extends beyond the HSCRC's GBR-defined service area in order to respond to the highest need, most isolated regions for cardiac surgery. The proposed service area encompasses the four "midshore counties" of Kent, Queen Anne's,

Talbot, and Caroline counties to reduce travel time and position AAMC to provide comprehensive cardiac care services to residents of these counties.

Capacity

In addition to the combined cardiology and surgical resources described above, AAMC has the capital infrastructure to provide cardiac surgery. The operating room (OR) area includes two previously constructed large surgical suites which may be readily adapted for cardiac surgery. The ORs are in direct proximity to AAMC's busy cardiac catheterization laboratories. The arrangement supports patient care as physicians can work closely together to provide the most appropriate treatment. The existing Surgical Intensive Care Unit (SICU) currently has capacity to care for post-operative cardiac surgery patients. These facilities are already in place and will not require additional expensive construction. In addition, philanthropic support from the community for a cardiac surgery program is expected to exceed \$5 million.

High Quality, Low Cost Healthcare

AAMC has repeatedly demonstrated its ability to maintain cost efficiency by having one of the lowest cost per EIPAs in Maryland. In fact, AAMC's High Quality, Low Cost (HQLC) initiatives continue to generate substantial cost savings and quality improvements. Health Services Cost Review Commission (HSCRC) data documents AAMC to be one of the lower charge hospital providers in the State of Maryland. Consistent with this track record, AAMC will be one of the lowest cost cardiac surgery programs in Maryland.

Under its GBR contract, AAMC is assigned responsibility for 1.1 million residents. However, at this time, more than 40% of residents from the GBR-defined service area who receive cardiac surgery are treated at Washington, D.C. hospitals, resulting in fragmented care and higher costs to private payers relative to surgery costs in Maryland. In CY 2013, a total of 378 residents from AAMC's GBR-defined service area were treated at Washington, D.C. hospitals, a large majority of whom were served at the Washington Hospital Center (WHC), where the average payment per case is more than 30% higher relative to community hospitals in Maryland providing cardiac surgery. Another 40% of the region's patients were treated at Maryland's two academic medical centers, where the average charge per cardiac surgery case is more than 50% higher relative to the average charge per cardiac surgery case at community hospitals in Maryland. In sharp contrast, AAMC's program will provide the region with one of the lowest charge per case for cardiac surgery in the state of Maryland. AAMC's projected payment rate will be nearly 40% lower relative to the estimated payment rate at the WHC for a comparable case mix, (approximately \$23,000 lower payment per discharge) and will be nearly 50% lower relative to

the average payment per discharge at Maryland's academic medical centers for a comparable case mix (approximately \$30,000 lower payment per discharge).²

In keeping with the principles of the Triple Aim, AAMC must be allowed to provide a continuum of healthcare services wherever it has expertise and capacity. This is essential to its role as an Accountable Care Organization (ACO). Population health management has become a national strategy for reducing healthcare costs while maintaining the health of individuals, and ACOs are in the forefront of that effort.

AAMC provides this level of care in the vast majority of its specialties and is fully capable of providing it in cardiac surgery. An integrated program of cardiac care that includes cardiac surgery will allow AAMC to offer the people it serves better health management, an improved patient experience with safe rapid access and rare transfers, a lower cost and, most importantly, a high-quality team of AAMC and JHM professionals working together to ensure the best possible outcome.

²The payment rate for Maryland hospitals is defined as 95.6% of charges, reflecting a blended Medicare and non-Medicare payment rate. Payment rate for Washington Hospital Center is calculated based on a blended Medicare and non-Medicare payment rate estimated based on commercial data obtained from a national claims data service (see "Technical Notes").

Complete the DEPARTMENTAL GROSS SQUARE FEET WORKSHEET (Table B) in the CON TABLE PACKAGE for the departments and functional areas to be affected.

Table B is attached with Appendix 1 - Tables.

9. CURRENT PHYSICAL CAPACITY AND PROPOSED CHANGES

Complete the Bed Capacity (Table A) worksheet in the CON Table Package if the proposed project impacts any nursing units.

The project does not impact any nursing units.

10. REQUIRED APPROVALS AND SITE CONTROL

- A. Site size: 26 acres
- B. Have all necessary State and local land use approvals, including zoning, for the project as proposed been obtained? YES X NO _____ (If NO, describe below the current status and timetable for receiving necessary approvals.)

C. Form of Site Control (Respond to the one that applies. If more than one, explain.):

- (1) Owned by: ANNE ARUNDEL MEDICAL CENTER, INC
Please provide a copy of the deed. (Attached as Exhibit 11)
- (2) Options to purchase held by: N/A
Please provide a copy of the purchase option as an attachment.
- (3) Land Lease held by: N/A
Please provide a copy of the land lease as an attachment.
- (4) Option to lease held by: N/A
Please provide a copy of the option to lease as an attachment.
- (5) Other: N/A
Explain and provide legal documents as an attachment.

11. PROJECT SCHEDULE

In completing this section, please note applicable performance requirement time frames set forth at COMAR 10.24.01.12B & C. Ensure that the information presented in the following table reflects information presented in Application Item 7 (Project Description).

	Proposed Project Timeline	
<u>Single Phase Project</u>		
Obligation of 51% of capital expenditure from CON approval date	2	months
Initiation of Construction within 4 months of the effective date of a binding construction contract, if construction project	1	months
Completion of project from capital obligation or purchase order, as applicable	5	months
<u>Multi-Phase Project</u> for an existing health care facility (Add rows as needed under this section)		
<u>One Construction Contract</u>	N/A	months
Obligation of not less than 51% of capital expenditure up to 12 months from CON approval, as documented by a binding construction contract.	N/A	months
Initiation of Construction within 4 months of the effective date of the binding construction contract.	N/A	months
Completion of 1 st Phase of Construction within 24 months of the effective date of the binding construction contract	N/A	months
<u>Fill out the following section for each phase.</u> (Add rows as needed)		
Completion of each subsequent phase within 24 months of completion of each previous phase	N/A	months
<u>Multiple Construction Contracts</u> for an existing health care facility (Add rows as needed under this section)		
Obligation of not less than 51% of capital expenditure for the 1 st Phase within 12 months of the CON approval date	N/A	months
Initiation of Construction on Phase 1 within 4 months of the effective date of the binding construction contract for Phase 1	N/A	months
Completion of Phase 1 within 24 months of the effective date of the binding construction contract.	N/A	months

<u>To Be Completed for each subsequent Phase of Construction</u>		
Obligation of not less than 51% of each subsequent phase of construction within 12 months after completion of immediately preceding phase	N/A	months
Initiation of Construction on each phase within 4 months of the effective date of binding construction contract for that phase	N/A	months
Completion of each phase within 24 months of the effective date of binding construction contract for that phase	N/A	months

12. PROJECT DRAWINGS

A project involving new construction and/or renovations must include scalable schematic drawings of the facility at least a 1/16" scale. Drawings should be completely legible and include dates.

Project Drawings are attached as Exhibit 3(a).

Project drawings must include the following before (existing) and after (proposed) components, as applicable:

- A. Floor plans for each floor affected with all rooms labeled by purpose or function, room sizes, number of beds, location of bathrooms, nursing stations, and any proposed space for future expansion to be constructed, but not finished at the completion of the project, labeled as "shell space".

For a project involving new construction and/or site work a Plot Plan, showing the "footprint" and location of the facility before and after the project.

- B. For a project involving site work schematic drawings showing entrances, roads, parking, sidewalks and other significant site structures before and after the proposed project.
- C. Exterior elevation drawings and stacking diagrams that show the location and relationship of functions for each floor affected.

13. FEATURES OF PROJECT CONSTRUCTION

- A. If the project involves new construction or renovation, complete the Construction Characteristics (Table C) and Onsite and Offsite Costs (Table D) worksheets in the CON Table Package.

Table C and D are attached with Appendix 1 - Tables.

- B. Discuss the availability and adequacy of utilities (water, electricity, sewage, natural gas, etc.) for the proposed project, and the steps necessary to obtain utilities. Please either provide documentation that adequate utilities are available or explain the plan(s) and anticipated timeframe(s) to obtain them.

The operating rooms and surgical intensive care rooms currently exist and are in service. Therefore, there is no impact to utilities.

PART II – PROJECT BUDGET

Use of Funds

Complete the Project Budget (Table E) worksheet in the CON Table Package.

Table E is attached with Appendix 1 - Tables.

PART III – APPLICANT HISTORY, STATEMENT OF
RESPONSIBILITY, AUTHORIZATION AND RELEASE
OF INFORMATION, AND SIGNATURE

**PART III - APPLICANT HISTORY, STATEMENT OF RESPONSIBILITY,
AUTHORIZATION AND RELEASE OF INFORMATION, AND SIGNATURE**

1. List names and addresses of all owners and individuals responsible for the proposed project.

Victoria W. Bayless, President/CEO
Anne Arundel Medical Center
2001 Medical Parkway
Annapolis, MD 21401
Anne Arundel Health System, Inc.
2001 Medical Parkway
Annapolis, MD 21401

2. Is any applicant, owner, or responsible person listed above now involved, or has any such person ever been involved, in the ownership, development, or management of another health care facility? If yes, provide a listing of each such facility, including facility name, address, the relationship(s), and dates of involvement.

Neither AAMC, Anne Arundel Health System Inc., nor Ms. Victoria Bayless owns or operates any other health care facility, as that term is defined in Section 19-114 of the Health General Article.

Anne Arundel Health System, Inc. does own certain other entities that provide health care services or related services, including:

Anne Arundel Health Care Enterprises, Inc.
Anne Arundel Medical Center Foundation, Inc.
Anne Arundel Real Estate Holding Company
Cottage Insurance Company LTD.
Anne Arundel Health Systems Research Institute, Inc.
Physician Enterprise, LLC
Anne Arundel General Treatment Services Inc.

3. In the last 5 years, has the Maryland license or certification of the applicant facility, or the license or certification from any state or the District of Columbia of any of the facilities listed in response to Question 2, above, ever been suspended or revoked, or been subject to any disciplinary action (such as a ban on admissions) ? If yes, provide a written explanation of the circumstances, including the date(s) of the actions and the disposition. If the applicant(s), owners, or individuals responsible for implementation of the project were not involved with the facility at the time a suspension, revocation, or disciplinary action took place, indicate in the explanation.

None of the health care facilities listed above has had its license or certification suspended, revoked, or subjected to disciplinary action in the last 5 years.

4. Other than the licensure or certification actions described in the response to Question 3, above, has any facility with which any applicant is involved, or has any facility with which any applicant has in the past been involved (listed in response to Question 2, above) ever received inquiries from a federal or any state authority, the Joint Commission, or other regulatory body regarding possible non-compliance with Maryland, another state, federal, or Joint Commission requirements for the provision of, the quality of, or the payment for health care services that have resulted in actions leading to the possibility of penalties, admission bans, probationary status, or other sanctions at the applicant facility or at any facility listed in response to Question 2? If yes, provide, for each such instance, copies of any settlement reached, proposed findings or final findings of non-compliance and related documentation including reports of non-compliance, responses of the facility, and any final disposition or conclusions reached by the applicable authority.

RESPONSE:

As follows, AAMC has received inquiries by the entities specified above in regard to the quality of or payment for health care services where the inquiry led to (or could still lead to) penalties, admission bans, probationary status, or other sanctions³:

3 Month Temporary Hold on Medicare Deemed Status - May 2013

- Outcome: No Penalties (Action Plan accepted, restored full Deemed Status July 2013).
- Actions/Monitoring: Documentation and monitoring initiative to improve language and interpretation services for patients with limited English proficiency.
- **Note: Self-Reported December 2012**

Radiation Misadministration – February 2008

- Outcome: Monetary Fine.⁴
- Actions/Monitoring Completed: Developed an Emergent Radiation Oncology Protocol.

³ Documentation regarding these incidents is enclosed as Exhibit 12.

⁴ A Maryland Department of the Environment Press release referencing this matter can be found at: <http://www.mde.state.md.us/programs/PressRoom/Pages/1086.aspx>

- **Note: Self-Reported**

Joint Commission Conditional Accreditation Status - July 2003

- Outcome: Action Plans accepted and awarded full Accreditation March 2004.
- Actions/Monitoring Completed: Established evidence of acceptable compliance with 5 Type 1 Recommendations (Medical Record Documentation, Medication Range Orders, Data Analysis, Departmental Scope of Services, and Job Description Performance Competencies.)

Medicare/Tricare Billing Claims for Infusion Therapy

- Outcome: Settlement including five year corporate integrity agreement (closed 2003) plus fine.
- Actions/Monitoring Completed: Appointment of Compliance Officer/Committee, Annual Corporate Compliance Education, Implementation of a Corporate Compliance Program.⁵

Note: Identified April 1999.

5. Has any applicant, owner, or responsible individual listed in response to Question 1, above, ever pled guilty to, received any type of diversionary disposition, or been convicted of a criminal offense in any way connected with the ownership, development, or management of the applicant facility or any of the health care facilities listed in response to Question 2, above? If yes, provide a written explanation of the circumstances, including as applicable, the court, the date(s) of conviction(s), diversionary disposition(s) of any type, or guilty plea(s).

RESPONSE:

No applicant, owner, or responsible individual listed in response to Question 1 above has pled guilty to or been convicted of a criminal offense in any way connected with the ownership, development or management of the applicant facility or any of the health care facilities listed in response to Question 2.

⁵ The institutional memory of relevant AAMC staff does not go further than this time period and therefore a comprehensive response to this question is not reasonably possible for time periods before 1999.

Attestation

Victoria W. Bayless, President and Chief Executive Officer, has signed an attestation as to the accuracy of the facts stated in this application and its attachments. Please see Exhibit 14.

**PART IV – CONSISTENCY WITH GENERAL
REVIEW CRITERIA AT COMAR 10.24.01.08G(3)**

10.24.01.08G(3)(a). State Health Plan Services

COMAR 10.20.10 – Acute Hospital Services

.04 Standards

A. General Standards

The following general standards encompass Commission expectations for the delivery of acute care services by all hospitals in Maryland. Each hospital that seeks a Certificate of Need for a project covered by this Chapter of the State Health Plan must address and document its compliance with each of the following general standards as part of its Certificate of Need application. Each hospital that seeks a Certificate of need exemption for a project covered by this Chapter of the State Health Plan must address and demonstrate consistency with each of the following general standards as part of its exemption request.

(1) Information Regarding Charges

Information regarding hospital charges shall be available to the public. After July 1, 2010, each hospital shall have a written policy for the provision of information to the public concerning charges for its services. At a minimum this policy shall include:

- (a) Maintenance of a Representative List of Services and Charges that is readily available to the public in written form at the hospital and on the hospital's internet web site;**
- (b) Procedures for promptly responding to individual requests for current charges for specific/ procedures; and**
- (c) Requirements for staff training to ensure that inquiries regarding charges for its services are appropriately handled.**

APPLICANT RESPONSE

(a) AAMC maintains a written policy titled Patient Financial Services – Hospital Financial Assistance, Charity Care, Billing & Collection Policy. Exhibit 1. That policy sets forth AAMC's procedure for providing a Representative List of Services and Charges. The list is available to the public in written form upon request or at any time by accessing <http://www.aahs.org/patients-visitors/billing.php>.

(b) The Patient Financial Services – Hospital Financial Assistance, Charity Care, Billing & Collection Policy sets forth the procedure for responding to individual requests for current charges for specific services and procedures. Requests are directed to the ACP Financial Coordinator (or the appropriate departmental Financial Coordinator) and the Coordinator responds to the request promptly according to the prescribed procedure.

(c) All AAMC registration staff and Financial Coordinators are educated and trained on appropriately handling inquiries regarding charges and services, including the use of the Patient Financial Services – Hospital Financial Assistance, Charity Care, Billing & Collection Policy.

(2) Charity Care Policy

Each hospital shall have a written policy for the provision of charity care for indigent patients to ensure access to services regardless of an individual's ability to pay.

(a) The policy shall provide:

- (i) Determination of Probable Eligibility. Within two business days following a patient's request for charity care services, application for medical assistance, or both, the hospital must make a determination of probable eligibility.**
- (ii) Minimum Required Notice of Charity Care Policy.**
 - 1. Public notice of information regarding the hospital's charity care policy shall be distributed through methods designed to best reach the target population and in a format understandable by the target population on an annual basis;**
 - 2. Notices regarding the hospital's charity care policy shall be posted in the admissions office, business office, and emergency department areas within the hospital; and**
 - 3. Individual notice regarding the hospital's charity care policy shall be provided at the time of preadmission or admission to each person who seeks services in the hospital.**

(b) A hospital with a level of charity care, defined as the percentage of total operating expenses that falls within the bottom quartile of all hospitals, as reported in the most recent Health Service Cost Review Commission Community Benefit Report, shall demonstrate that its level of charity care is appropriate to the needs of its service area population.

APPLICANT RESPONSE

AAMC maintains a written policy for the provision of charity care for indigent patients to ensure access to services regardless of an individual's ability to pay.

- (a) AAMC maintains a written policy titled Patient Financial Services – Hospital Financial Assistance, Charity Care, Billing & Collection Policy. Exhibit 1. That policy meets the requirements set forth in (a)(i) and (a)(ii) above. It also describes AAMC's procedure for providing appropriate notification to the public and patients regarding the charity care available at AAMC. If charity care is requested, the patient is given a determination of probable eligibility within two business days of receipt of a patient's request for charity care services or application for medical assistance.
- (b) AAMC's charity care as a percentage of total operating expense falls within the bottom quartile for Maryland hospitals as reported in the most recent Health Services Cost

Review Commission Community Benefit Report. This is primarily due to AAMC's patient population being relatively more affluent when compared to median incomes for Maryland as well as AAMC initiatives to enroll low-income patients eligible for coverage (See Exhibit 2 for media accounts of these initiatives). AAMC has a very generous charity care policy, providing 100% charity to households at or below 200% of the US Poverty Line and a sliding fee scale for households at or below 330% of the US Poverty Line. Despite this generous charity care policy, due to patient demographics, a relatively small amount of charity care is provided.

Although AAMC's charity care is lower than that provided by other hospitals in Maryland, AAMC is committed to contributing to the community and supporting vulnerable populations. To that end, AAMC provides the community significant services and numerous outreach programs. For additional information on AAMC's outreach initiatives, please see our Outreach Section in this application. AAMC's commitment to serving the community is demonstrated by the fact that AAMC's total Community Benefit for FY 2014 was \$36,050,991, which was in the top third for all hospitals in Maryland for total benefit (See Exhibit 5(c) – Community Benefit Report).

It is important to note that the Maryland Rate Setting System provides for funding of charity care across all Maryland hospitals. To that end, AAMC does contribute its proportionate share of that funding to support care for all of the disadvantaged patients across the state of Maryland.

(3) Quality of Care

An acute care hospital shall provide high quality care.

- (a) Each hospital shall document that it is:**
 - (i) Licensed, in good standing, by the Maryland Department of Health and Mental Hygiene;**
 - (ii) Accredited by the Joint Commission; and**
 - (iii) In compliance with the conditions of participation of the Medicare and Medicaid programs.**
- (b) A hospital with a measure value for a Quality Measure included in the most recent update of the Maryland Hospital Performance Evaluation Guide that falls within the bottom quartile of all hospitals' reported performance measured for that Quality Measure and also falls below a 90% level of compliance with the Quality Measure, shall document each action it is taking to improve performance for that Quality Measure.**

APPLICANT RESPONSE

AAMC provides high quality care, as evidenced by the following accreditation and recognitions.

(a)(i) AAMC is a licensed acute care hospital. AAMC is in possession of Maryland Department of Health and Mental Hygiene Office of Health Care Quality License Number 02003 issued on November 23, 2013 through February 23, 2017. (Exhibit 10(a)).

(a)(ii) AAMC is accredited by The Joint Commission and earned the Delmarva Quality Improvement Award in 2013 and 2014. The last full survey by The Joint Commission was successfully concluded on November 14, 2013. (Exhibit 10(b)). AAMC is also accredited by the Joint Commission as an Advanced Primary Stroke Center awarded in October of 2014.

(a)(iii) AAMC is in full compliance with the conditions of participation of the CMS.

(b) According to the Centers for Medicare and Medicaid Services: Hospital Compare data posted and updated as of December 18, 2014, of the 43 applicable performance measures, AAMC ranked at or above the state and/or national averages on 33 measures with 6 being above 99%. As of January 2014, the measure "Children and Their Caregivers Who Receive a Home Management Plan of Care Document" is no longer a reportable measure. In addition, no data was available for any of the stroke care measures.

According to the most recent update on Hospital Compare, AAMC ranked second in the state of Maryland regarding patient satisfaction with an overall ranking of 77% (patients who gave the hospital a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest)). AAMC has received 18 National Awards for patient satisfaction since 2004.

AAMC was 140 minutes beyond the Maryland average for the measure, “Median Time from ED Arrival to ED Departure for Admitted ED Patients”, and 138 minutes beyond the Maryland average for “Admit Decision Time to ED Department time for Admitted Patients”.

AAMC implemented a High Quality Low Cost Initiative utilizing lean rapid improvement event teams currently working on strategies to improve both the Median Time from ED Arrival to ED Departure for Admitted ED Patients and Admit Decision Time to ED Departure time for Admitted Patients. Below is a list of actions put in place to reduce both time frames:

- Geographic staffing implemented following inpatient Value Stream Analysis (VSA)
- Bridge orders utilized to expedite patient movement to clean and ready beds
- Unit-specific dashboards with throughput measures presented monthly to clinical leadership and Clinical Resource Management
- Every 2 hour huddles for CCU holds in the ED, including CCU and ED nursing and physician leadership
- Administrative coordinator report for patients waiting more than 90 minutes for admission orders every 8 hours
- Multidisciplinary rounds on inpatient units to identify and expedite early discharges
- Monitoring of diversion and alerts every 4 hours
- Monthly throughput committee meeting

Building on these infrastructure changes, a focused lean project was implemented in December 2014. Fundamental to the project is daily planning to expedite patient flow with nurses, physician leaders and hospitalists. Recent results demonstrate improvements of 30 minutes in ED throughput measures.

B. Project Review Standards

The standards in this section are intended to guide reviews of Certificate of Need applications and exemption requests involving acute care general hospital facilities and services. An applicant for a Certificate of Need must address, and its proposed project will be evaluated for compliance with, all applicable review standards. An applicant for a Certificate of Need exemption must address, and its proposed project will be evaluated for consistency with, all applicable review standards.

(1) Geographic Accessibility

A new acute care general hospital or an acute care general hospital being replaced on a new site shall be located to optimize accessibility in terms of travel time for its likely service area population. Optimal travel time for general medical/surgical, intensive/critical care and pediatric services shall be within 30 minutes under normal driving conditions for 90 percent of the population in its likely service area.

APPLICANT RESPONSE

This standard is not applicable to the proposed project.

(2) Identification of Bed Need and Addition of Beds

Only medical/surgical/gynecological/addictions ("MSGA") beds and pediatric beds identified as needed and/or currently licensed shall be developed at acute care general hospitals.

(a) Minimum and maximum need for MSGA and pediatric beds are determined using the need projection methodologies in Regulation .05 of this Chapter.

(b) Projected need for trauma unit, intensive care unit, critical care unit, progressive care unit, and care for AIDS patients included in the MSGA projection.

(c) Additional MSGA or pediatric beds may be developed or put into operation only if:

(i) The proposed additional beds will not cause the total bed capacity of the hospital to exceed the most recent annual calculation of licensed bed capacity for the hospital made pursuant to Health-General § 19-307.2; or

(ii) The proposed additional beds do not exceed the minimum jurisdictional bed need projection adopted by the Commission and calculated using the bed need projection methodology in Regulation .05 of this Chapter; or

(iii) The proposed additional beds exceed the minimum jurisdictional bed need projection but do not exceed the maximum jurisdictional bed need projection adopted by the Commission and calculated using the bed need projection methodology in Regulation .05 of this Chapter and the applicant can demonstrate need at the applicant hospital for bed capacity that exceeds the minimum jurisdictional bed need projection; or

(iv) The number of proposed additional MSGA or pediatric beds may be derived through application of the projection methodology, assumptions, and targets contained in Regulation .05 of this Chapter, as applied to the service area of the hospital.

APPLICANT RESPONSE

This standard is not applicable to the proposed project.

(3) Minimum ADC for Establishment of Pediatric Unit

An acute care general hospital may establish a new pediatric service only if the projected average daily census of pediatric patients to be served by the hospital is at least five patients, unless:

- (a) The hospital is located more than 30 minutes travel time under normal driving conditions from a hospital with a pediatric unit; or**
- (b) The hospital is the sole provider of acute care general hospital services in the jurisdiction.**

APPLICANT RESPONSE

This standard is not applicable to the proposed project.

(4) Adverse Impact

A capital project undertaken by a hospital shall not have an unwarranted adverse impact on hospital charges, availability of services, or access to services. The Commission will grant a Certificate of Need only if the hospital documents the following:

- (a) If the hospital is seeking an increase in rates from the Health Services Cost Review Commission to account for the increase in capital costs associated with the proposed project and the hospital has a fully-adjusted Charge Per Case that exceeds the fully adjusted average Charge Per Case for its peer group, the hospital must document that its Debt to Capitalization ratio is below the average ratio for its peer group. In addition, if the project involves replacement of physical plant assets, the hospital must document that the age of the physical plant assets being replaced exceed the Average Age of Plant for its peer group or otherwise demonstrate why the physical plant assets require replacement in order to achieve the primary objectives of the project; and**
- (b) If the project reduces the potential availability or accessibility of a facility or service by eliminating, downsizing, or otherwise modifying a facility or service, the applicant shall document that each proposed change will not inappropriately diminish, for the population in the primary service area, the availability or accessibility to care, including access for the indigent and/or uninsured.**

APPLICANT RESPONSE

This standard is not applicable to the proposed project. In response to Part (a), AAMC did not assume a rate increase in the financial projections included in the application for the capital project and there is no unwarranted impact on hospital charges related to this project. In response to Part (b), AAMC is not reducing the availability or accessibility of any services.

(5) Cost Effectiveness

A proposed hospital capital project should represent the most cost effective approach to meeting the needs that the project seeks to address.

- (a) To demonstrate cost effectiveness, an applicant shall identify each primary objective of its proposed project and shall identify at least two alternative approaches that it considered for achieving these primary objectives. For each approach, the hospital must:
 - (i) To the extent possible, quantify the level of effectiveness of each alternative in achieving each primary objective;**
 - (ii) Detail the capital and operational cost estimates and projections developed by the hospital for each alternative; and**
 - (iii) Explain the basis for choosing the proposed project and rejecting alternative approaches to achieving the project's objectives.****
- (b) An applicant proposing a project involving limited objectives, including, but not limited to, the introduction of a new single service, the expansion of capacity for a single service, or a project limited to renovation of an existing facility for purposes of modernization, may address the cost effectiveness of the project without undertaking the analysis outlined in (a) above, by demonstrating that there is only one practical approach to achieving the project's objectives.**
- (c) An applicant proposing establishment of a new hospital or relocation of an existing hospital to a new site that is not within a Priority Funding Area as defined under Title 5, Subtitle 7B of the State Finance and Procurement Article of the Annotated Code of Maryland shall demonstrate:
 - (i) That it has considered, at a minimum, an alternative project site located within a Priority Funding Area that provides the most optimal geographic accessibility to the population in its likely service area, as defined in Project Review Standard (1);**
 - (ii) That it has quantified, to the extent possible, the level of effectiveness, in terms of achieving primary project objectives, of implementing the proposed project at each alternative project site and at the proposed project site;**
 - (iii) That it has detailed the capital and operational costs associated with implementing the project at each alternative project site and at the proposed project site, with a full accounting of the cost associated with****

- transportation system and other public utility infrastructure costs;
and**
- (iv) That the proposed project site is superior, in terms of cost effectiveness to the alternative project site or sites located within a Priority Funding Area.**

APPLICANT RESPONSE

(a) AAMC is proposing a project limited to a single service. Therefore, the cost-effectiveness of the project is addressed in (b), below.

(b) This project has the limited objective of the introduction of a new single service, cardiac surgery, at AAMC.

In particular, this project will reassign the use of two existing operating rooms, ORs #15 and #16, in AAMC's South Tower for cardiac surgery.⁶ No changes in room size are necessary. They will only require updates to the integrated video and audio system to meet the specific needs of this surgery. These rooms are already part of the surgical services facilities which were designed for the efficient flow of patient care from pre-operative through post-anesthesia care. The existing surgical waiting areas, registration and pre/post-operative areas are close-by, can accommodate the additional cases, and will remain unchanged.

Because the only practical approach to meet that objective is establishing a cardiac surgery program, the analysis outlined in (a) above is not required. However, AAMC did consider the following options in determining what operating rooms to utilize for the service:

1. Conversion of North Hospital Pavilion operating rooms #11 and #12 for cardiac surgery use, one for emergency surgery and one for elective cases. This option required deconstruction of both ORs, replacement of lights, booms and a new audio-video integration system. Electrical, mechanical and lighting reviews for upgrades, modernization of ORs, Automatic Building Control systems upgrades and the creation of a perfusion room with storage were required.

This alternative was rejected as it was a more costly option than converting operating rooms #15 and #16.

⁶ The efficiency of the proposed conversion of existing operating rooms is described in more detail in the response to Standard 11 below (Efficiency). An equipment list is attached as Exhibit 3(c) and a capital estimate is attached as Exhibit 3(d).

2. Conversion of North Hospital Pavilion Operating rooms #9 and #10 for cardiac surgery use, one for emergency surgery and one for elective surgery. This option would require a review and potential upgrade of electrical, mechanical and automated building control systems. Construction would be needed to expand the storage room between these spaces for perfusion use. Additional anesthesia columns and equipment booms would need to be added as well as additional monitors for the audio visual integration system.

This alternative was rejected since it is a more costly option with construction and additional equipment needs. There would also be additional costs incurred to relocate current service line surgeries performed in these rooms elsewhere.

3. Modification of an approved new cardiac catheterization lab to convert existing storage space in the North Hospital Pavilion to a hybrid cardiac surgery OR; and use existing OR # 12 for elective cardiac surgery cases. The cost of construction, equipment and the additional costs to meet the heating, ventilation and air conditioning (HVAC) requirements for a cardiac surgery OR were greater than the recommended alternative.
4. Building out a portion of the reserved second floor shell space was considered and rejected. This alternative was rejected due to the project timing of the catheterization lab project already in progress and the costs of additional construction and equipment for the conversion to a hybrid room. The cost of building out two cardiac surgery ORs and associated support spaces would be greater than the cost of repurposing existing ORs #15 and #16.
5. The design decision that has been finalized for this application, the reassignment of ORs 15 and 16 for cardiac surgery, makes the best use of existing AAMC resources, requires only modification rather than new construction, and is well-integrated with current patient care processes. It is described in detail in Section 11 – Efficiency.
6. Doing nothing was considered and rejected. AAMC believes there is a community need for AAMC to offer a full service cardiovascular program as documented in this application in compliance with COMAR 10.24.17 of the State Health Plan. AAMC provides both emergency and elective PCI through its waiver obtained from the Maryland Health Commission (MHCC) and designation as a Cardiac Intervention Center by the Maryland Institute for Emergency Medical Services Systems (MIEMSS) and is a designated Cycle IV Chest Pain Center with PCI by the Society of Cardiovascular Patient Care.

(c) AAMC is not proposing the establishment of a new hospital or the relocation of an existing hospital. Therefore, section (c) of this question is not applicable.

(6) Burden of Proof Regarding Need

A hospital project shall be approved only if there is demonstrable need. The burden of demonstrating need for a service not covered by Regulation .05 of this Chapter or by another chapter of the State Health Plan, including a service for which need is not separately projected, rests with the applicant.

APPLICANT RESPONSE

This standard is not applicable to the proposed project.

The applicable chapter of the State Health Plan (COMAR 10.24.17) includes its own need standard at COMAR 10.24.17.05(A)(6).

(7) Construction Cost of Hospital Space

The proposed cost of a hospital construction project shall be reasonable and consistent with current industry cost experience in Maryland. The projected cost per square foot of a hospital construction project or renovation project shall be compared to the benchmark cost of good quality Class A hospital construction given in the Marshall Valuation Service® guide, updated using Marshall Valuation Service® update multipliers, and adjusted as shown in the Marshall Valuation Service® guide as necessary for site terrain, number of building levels, geographic locality, and other listed factors. If the projected cost per square foot exceeds the Marshall Valuation Service® benchmark cost, any rate increase proposed by the hospital related to the capital cost of the project shall not include the amount of the projected construction cost that exceeds the Marshall Valuation Service® benchmark and those portions of the contingency allowance, inflation allowance, and capitalized construction interest expenditure that are based on the excess construction cost.

APPLICANT RESPONSE

The proposed cost of the hospital construction project is reasonable and consistent with current industry cost experience in Maryland, as evidenced by the Marshall Valuation Service (MVS) analysis of construction costs for this project. This analysis is set forth in Exhibit 3(b).

(8) Construction Cost of Non-Hospital Space

The proposed construction cost of non-hospital space shall be reasonable and in line with current industry cost experience. The projected cost per square foot of non-hospital space shall be compared to the benchmark cost of good quality Class A construction given in the Marshall Valuation Service© guide for the appropriate structure. If the projected cost per square foot exceeds the Marshall Valuation Service© benchmark cost, any rate increase proposed by the hospital related to the capital cost of the non-hospital space shall not include the amount of the projected construction cost that exceeds the Marshall Valuation Service© benchmark and those portions of the contingency allowance, inflation allowance, and capitalized construction interest expenditure that are based on the excess construction cost. In general, rate increases authorized for hospitals should not recognize the costs associated with construction of non-hospital space.

APPLICANT RESPONSE

This standard is not applicable to the proposed project.

(9) Inpatient Nursing Unit Space

Space built or renovated for inpatient nursing units that exceeds reasonable space standards per bed for the type of unit being developed shall not be recognized in a rate adjustment. If the Inpatient Unit Program Space per bed of a new or modified inpatient nursing unit exceeds 500 square feet per bed, any rate increase proposed by the hospital related to the capital cost of the project shall not include the amount of the projected construction cost for the space that exceeds the per bed square footage limitation in this standard or those portions of the contingency allowance, inflation allowance, and capitalized construction interest expenditure that are based on the excess space.

APPLICANT RESPONSE

This standard is not applicable to the proposed project.

(10) Rate Reduction Agreement

A high-charge hospital will not be granted a Certificate of Need to establish a new acute care service, or to construct, renovate, upgrade, expand, or modernize acute care facilities, including support and ancillary facilities, unless it has first agreed to enter into a rate reduction agreement with the Health Services Cost Review Commission, or the Health Services Cost Review Commission had determined that a rate reduction agreement is not necessary.

APPLICANT RESPONSE

In the most recently published Reasonableness of Charge Comparison (Spring 2011), AAMC was 0.695 below its peer group hospitals. In addition, AAMC negotiated a Global Budget Agreement in April 2014 and was not identified by the HSCRC as being a high cost/high charge hospital in need of a rate reduction.

(11) Efficiency

A hospital shall be designed to operate efficiently. Hospitals proposing to replace or expand diagnostic or treatment facilities and services shall:

- (a) Provide an analysis of each change in operational efficiency projected for each diagnostic or treatment facility and service being replaced or expanded, and document the manner in which the planning and design of the project took efficiency improvements into account; and**
- (b) Demonstrate that the proposed project will improve operational efficiency when the proposed replacement or expanded diagnostic or treatment facilities and services are projected to experience increases in volume of services delivered; or**
- (c) Demonstrate why improvements in operational efficiency cannot be achieved.**

APPLICANT RESPONSE

(a) Analysis of Change and (b) Improvement of Operational Efficiency

No existing service is being replaced or expanded, however AAMC's facility design for cardiac surgery is based on efficiency and functionality. It integrates with the current work flow for patients, physicians, clinical staff, support staff and supply management. The proposed facility will be state of the art and include the following efficiency and performance features:⁷

2nd Floor - Operating Rooms

This project will reassign the use of two existing operating rooms, ORs #15 and #16, in AAMC's South Tower for cardiac surgery. No changes in room size are necessary. They will only require updates to the integrated video and audio system to meet the specific needs of this surgery. These rooms are already part of the surgical services facilities which were designed for the efficient flow of patient care from pre-operative through post-anesthesia care.

The existing surgical waiting areas, registration and pre/post-operative areas are close-by, can accommodate the additional cases, and will remain unchanged.

Trauma Elevator

⁷ While this question is not applicable because AAMC is not seeking to "replace or expand" a service, but instead is creating a new service, this response is presented to outline the efficiencies associated with the project.

The existing dedicated trauma elevator is appropriately sized for transport of cardiac patients and will not require any modifications for this project. The trauma elevator serves the Emergency Department on the first floor, the Surgical Suite on the second floor, the Critical Care Unit on the third floor, and the helipad located on the seventh floor of the North Hospital Pavilion.

3rd Floor - Critical Care Unit and Surgical Intensive Care Unit

No modifications to the room size/footprint are necessary to support post cardiac surgery patients. The critical care rooms are located on the third floor of the North Hospital Pavilion and are in direct proximity to the trauma elevator. In addition, the Surgical Intensive Care Unit (SICU), which opened in 2014, has capacity for post-op cardiac surgery patients.

The current critical care rooms are all private with ancillary support spaces located within close proximity. Each room has adequate medical gases, emergency power and equipment booms to handle high acuity patients.

The nursing support area consists of decentralized nursing alcoves, pneumatic tube stations, medication and supply rooms that are in close proximity to the dedicated cardiovascular rooms.

4th Floor - Heart & Vascular Unit

The Heart and Vascular unit is on the fourth floor of the North Tower with all private patient rooms and appropriate clinical and non-clinical support areas. No physical changes are needed to support cardiac surgery patients. It is well-suited to be a step-down unit for post-operative cardiac surgery patients.

Ancillary Services

There are no identified physical or operational changes needed to support the cardiovascular surgical program at this time.

AAMC believes that the aforementioned outlined utilization of existing spaces is the most efficient method of instituting this new service.

(C) Operational Efficiency

Not Applicable

(12) Patient Safety

The design of a hospital project shall take into account patient safety into consideration and shall include design features that enhance and improve patient safety. A hospital proposing to replace or expand its physical plant shall provide an analysis of patient safety features included in each facility or service being replaced or expanded, and document the manner in which the planning and design of the project took patient safety into account.

APPLICANT RESPONSE

In keeping with its longstanding commitment to patient safety, AAMC's plan for the project includes state-of-the-art design features that will maximize the safety of the cardiac surgery program.

AAMC's Commitment to Safety

AAMC has been recognized as a leading organization for patient safety:

- (i) In the field of surgery, AAMC was ranked in the top ten hospitals nationwide in 2013 by Consumer Reports for surgical safety.
- (ii) The MPSC has given AAMC's Medical-Surgical Unit a Circle of Honor Award for its reduction in catheter-associated urinary tract infections.
- (iii) AAMC's "4-PTS" hotline has been recognized by the Maryland Patient Safety Center as a model for the reporting of patient safety issues by hospital staff.⁸
- (iv) The Maryland Patient Safety Center selected AAMC as the 2015 Minogue Award for Patient Safety Innovation for Patient and Family Centered Inpatient White Boards: Engaging Patients and Families in Their Care.
- (v) The Maryland Patient Safety Center also awarded AAMC two Circle of Honor Awards for Management of Medication Reconciliation and Effective Fall Reduction in Inpatient Oncology Unit.

This recognition grows from a systematic AAMC initiative, begun in 2000, to redouble efforts to identify and systematically eliminate safety risks for patients. The initiative has since grown into an integrated set of programs that cross multiple disciplines and departments such as nursing, medical, pharmacy, ancillary services, bioengineering, and environment of care.

Design Features Maximizing Patient Safety

⁸ Under this model, any staff member may report, and all reports are investigated, resulting in numerous system-based improvements in patient safety.

AAMC will implement a number of design features to make AAMC's cardiac surgery safe:

(i) **Safety-Oriented Nursing Model**

AAMC's established nursing model –to be extended to the project - emphasizes patient bedside care. Under the model, all patient spaces have been standardized according to patient type and acuity. The nursing staff uses communication areas, bedside computers, and workstations outside the patient room to make electronic medical record entries, in lieu of the older, more traditional centralized nursing approach.

(ii) **Visibility of Patients to Staff**

The units on the two floors dedicated to the project are designed to maximize visibility of patients from caregiver work areas with central corridors and decentralized caregiver work areas that facilitate keeping staff immediately accessible to patient rooms.

Decentralized supply pods keep medications, nourishment and supplies in immediate vicinity of patient rooms, improving efficiency and allowing staff to spend more time with patients.

(iii) **Electronic Medical Record and Technology Integration**

AAMC successfully uses advanced information technology in the clinical setting. AAMC implemented EPIC, its house-wide clinical information system in December 2009 and has continued to evolve. Computerized physician order entry (CPOE) has been implemented and is used by all physicians.

The project's design will incorporate AAMC's information technology into the clinical activities necessary to support patient safety. The project will fully integrate physiological monitoring, IV pumps and ventilators into a comprehensive communication system (with nurse call and wireless phones) to notify care providers of alarms and alerts for immediate response, all the while capturing the data in the patient's electronic medical record (EMR).

These features have dramatically improved caregiver response, ensuring patient safety.

Wireless technology was introduced in 1999 throughout the clinical departments. There are computers in workstations or workstations on wheels (WOWs) between every two patient rooms as well as mobile wireless laptops on every unit. Improvements in patient care are achieved with timely access to data by multiple caregivers simultaneously, point of care data entry to accomplish real time documentation, integration of hemodynamic values, vital signs and ventilator data into the documentation system. Patient privacy and confidentiality are maintained through comprehensive privacy and security policies and procedures implemented in compliance

with Health Insurance Portability and Accountability Act (HIPAA).⁹ AAMC utilizes software which is installed on all IV pumps and monitors the exact dose and administration of medication in each patient's IV. This technology offers significant improvement in the reduction of medication errors.

AAMC has a long history of utilizing clinical information systems throughout its physical footprint to improve patient safety and coordinate care. Those capabilities have included full nursing documentation, automating the medication administration process with bar-coding and medication distribution, (PYXIS) technologies for drug distribution, integrated nurse call wireless communication systems and full automation of ancillary departments delivering lab and radiology results into the EMR.

In the fall of 2008, AAMC launched a project to fully integrate all care processes through automation. The primary objective for this change in clinical computing was to automate physician care processes and deliver a closed-loop medication process (order to dispense to administration). With EPIC, nursing and the support ancillaries continue to be fully automated, and physicians now enter orders directly into the system (CPOE) and document many of their notes electronically. Patient safety is thereby improved by complete automation of most clinical processes, more complete and ready access to relevant clinical information by all caregivers and enhanced clinical decision support for all caregivers.

(iv) **Noise Reduction**

AAMC has made noise reduction a priority. Patients, visitors and groups from other hospitals touring the facility often comment on the quietness of the facility and patient units. AAMC has:

- a. Installed carpet, when appropriate, to reduce sound in common areas (corridors, caregiver work areas, etc.).
- b. Constructed partitions for patient rooms from the underside of the floor deck above, insulating them to eliminate the transmission of sound.¹⁰
- c. Placed sound absorptive panels and electronic white noise in areas that tend to be noisy (i.e. central caregiver work areas).
- d. Isolated noise-generating equipment (i.e. ice makers) to rooms and closets whenever possible.

⁹ Clinical automation at AAMC is supported by appropriate access and security mechanisms. Access is provided by both wired (including devices in patient rooms where appropriate) and wireless technologies (both Workstations on Wheels and tablets). The current density of devices available for clinical uses ranges from two to three devices per user.

¹⁰ In addition to creating a quiet environment, the partitions help protect patient privacy, which is an important consideration in connection with HIPAA regulations.

- e. Minimized overhead paging, replacing it with vibrating mobile devices, such as pagers and mobile phones.
- f. Placed appropriate wheels on rolling equipment and carts to reduce sound generated by moving the equipment.

(v) **Room Design for Vulnerable Patients**

The cardiac surgery program will use rooms that maximize safety for vulnerable patient groups. Private rooms are to be used because multi-patient rooms and spaces are disruptive and often negatively stimulate vulnerable patients, as well as disrupt sleep patterns. Rooms are adequately sized to provide appropriate space for patients, caregivers, family and equipment. Toilet rooms are directly accessible from bedside.

The configuration of patient rooms facilitates patient transport during emergencies. Patients and equipment do not have to be transported through the narrow alcove adjacent to toilets often found within industry standard patient rooms. Private rooms and treatment spaces promote better infection control and reduce possibility of medications being administered to the wrong patient.

Organization of equipment and configuration of headwalls reduces the number of cords, wiring, and tubes which touch the floor and often result in a tripping hazard. Patient rooms and treatment spaces are sized, when appropriate, to facilitate resuscitation in connection with patient codes.

(vi) **Efficient Use of Staff Time**

AAMC has optimized a decentralized layout of the patient rooms/units for the project to minimize (1) caregiver response time to patient needs and emergencies, (2) caregiver fatigue, and (3) caregiver time spent on tasks other than direct patient care. In particular:

- a. Caregivers are stationed near their patients.
- b. Supplies and other needed items are in close proximity to caregivers and patients.
- c. Distances that caregivers need to routinely travel during the course of a shift are minimized. For instance, central functions which must be shared by an entire unit (e.g. nursing station, clean/soiled utility, and nourishment) are located in the center of the unit, and distances to elevators are minimized by also having them in a core at the center of the unit.
- d. Four computerized tube transport systems with security lock transport per floor reduce the need for hand delivery and allow for the secure transport of drugs for patients directly from the pharmacy to the caregiver.
- e. Nursing documentation stations have been designed with chairs allowing staff to sit.

AAMC's initiatives in information technology, physical plant optimization, and workflow management have earned AAMC a strong reputation for patient safety and provide a solid foundation for the project.

(13) Financial Feasibility

A hospital capital project shall be financially feasible and shall not jeopardize the long-term financial viability of the hospital.

- (a) Financial projections filed as part of a hospital Certificate of Need application must be accompanied by a statement containing each assumption used to develop the projections.**
- (b) Each applicant must document that:**
 - (i) Utilization projections are consistent with observed historic trends in use of the applicable services(s) by the service area population of the hospital or State Health Plan need projections, if relevant;**
 - (ii) Revenue estimates are consistent with utilization projections and are based on current charge levels, rates of reimbursement, contractual adjustments and discounts, bad debt, and charity care provisions, as experienced by the applicant hospital or, if a new hospital, the recent experience of other similar hospitals;**
 - (iii) Staffing and overall expense projections are consistent with utilization projections and are based on current expenditure levels and reasonably anticipated future staffing levels as experienced by the applicant hospital, or, if a new hospital, the recent experience of other similar hospitals; and**
 - (iv) The hospital will generate excess revenues over total expenses (including debt service expenses and plant and equipment depreciation), if utilization forecasts are achieved for the specific services affected by the project within five years or less of initiating operations with the exception that a hospital may receive a Certificate of Need for a project that does not generate excess revenues over total expenses even if utilization forecasts are achieved for the services affected by the project when the hospital can demonstrate that overall hospital financial performance will be positive and that the services will benefit the hospital's primary service area population.**

APPLICANT RESPONSE

The proposed project is financially feasible. It is forecasted to generate a positive margin in program years 2 and 3 (FY2017-2018). Even if the project is not immediately margin-positive, supporting the project would not threaten the financial viability of AAMC.

The following section presents the basis for utilization projections, revenue estimates, staffing models, and expense projections contained in the financial tables for this CON application.

(b)(i) Volume projections

Volume projections are defined by adult cardiac surgery discharges, based on procedure codes defined in Maryland regulations for Specialized Cardiac Services. AAMC projected its cardiac surgery discharges based on projected use rates for the defined service area and based on AAMC's target market share for cardiac surgery in the defined service area. These projections are consistent with the following trends, which are described in more detail in the response to COMAR 10.24.17.05(A)(1) – Minimum Volume Standard – and summarized below:

- AAMC's strong, existing cardiac care program – AAMC medical staff recommends cardiac surgery to a sufficient volume of its current inpatient and outpatient cardiac patients to support the project. AAMC's current base of affiliated cardiologists generates the volume to support a cardiac surgery program of greater than 200 cases.
- Johns Hopkins Partnership – AAMC is developing the project in collaboration with JHM. AAMC expects, as reflected in the letters of support for this application, that JHM clinicians, (Appendix 3 – Letters of Support) who now treat patients from the service area to JHH, will choose to perform cardiac surgery at AAMC for a substantial portion of those patients.
- Volume growth in service area - Need in the AAMC's service area has grown notwithstanding statewide use rate trends. Between CY2012-2013, adult cardiac surgery volume in each of AAMC's subregions grew considerably, reflecting population growth rates, the aging of this population, and the plateauing of use rates.

Chart 1
Number of Adult Cardiac Surgery Discharges

	CY2012	CY2013	% Growth
Anne Arundel County	444	513	15%
4 Midshore Counties	130	178	37%
Prince George's & Calvert Counties: AAMC Segments	216	254	17%
Total	790	945	20%

Sources:

- (1) HSCRC Discharge Abstracts
- (2) DCHA Discharge Database

- Expectations for reducing outmigration – In CY2013, a total of 339 cardiac surgery cases from this region (or, 36% of discharges) were served at the Washington Hospital Center. AAMC expects to redirect more than 200 cases now treated at Washington, DC hospitals to AAMC's new program; volume projections are based on the assumption that patients, physicians, and payers will drive this change based on the preference for continuity of care, proximity to home, access to surgeons from JHM, and greater affordability of the program at AAMC.
- Second order effects – AAMC expects to retain more patients in its service area as AAMC builds the program's reputation and clinician relationships. In particular, AAMC expects to treat patients who currently do not come to AAMC for PCI or other cardiac services due to AAMC's lack of a cardiac surgery program. This expectation is reasonable, since AAMC's specialty surgical programs provides evidence that AAMC captures significant market share for its specialty programs.

Case mix and utilization per discharge: Assumptions

The financial projections assumed a case mix comparable to cardiac surgery programs at non – academic medical centers in Maryland.

The fundamental premise is that the mix of cases at AAMC and the utilization patterns accompanying this volume will be comparable to the FY 2014 utilization profile at other non-academic medical centers in Maryland for cardiac surgery cases. Based on a composite profile of all adult cardiac surgery cases at non-academic medical centers in Maryland, the following volumes by APR-DRG were assumed:

Chart 2
Number of Transfers

APR-DRG	Description	2017	2018	2019
4	Tracheostomy W Long Term Mechanical Ventilation W Extensive Procedure	3	4	4
162	Cardiac Valve Procedures W Cardiac Catheterization	23	32	37
163	Cardiac Valve Procedures W/O Cardiac Catheterization	60	84	97
165	Coronary Bypass W Cardiac Cath Or Percutaneous Cardiac Procedure	91	127	146
166	Coronary Bypass W/O Cardiac Cath Or Percutaneous Cardiac Procedure	64	90	103
Total		241	337	387
Current Inpatient Transfer Cases from AAMC		179		
<i>Transfers as a percentage of projected volume</i>		74%		

For each APR-DRG listed above, AAMC is assumed to have the same utilization profile by HSCRC rate center as is documented for cardiac surgery patients at non-academic medical centers in Maryland. This produced the following assumptions for financial projections:

- Average length of stay = 8.5 days
- CMI = 3.42

(b)(ii) Revenue estimates

Anne Arundel’s charge per case for cardiac surgery is derived from its average charge per case at a CMI of 1.0 (\$10,962) and the average case mix of non-AMC OHS providers (3.4209) as \$37,501:

$$\$37,501 = \$10,962 * 3.4209$$

In addition, projected incremental revenue was reduced for the impact of cases currently transferred from AAMC to other hospitals, cases which are expected to remain at AAMC and convert to cardiac surgery cases at AAMC.

The revenue projections assume that AAMC’s GBR will be adjusted for incremental volume related to the project (incremental cardiac surgery revenue less transfer cases) at an 85% variable cost factor for the first three years of the project.

Deductions from revenue are estimated to be 15.3% based on AAMC’s actual experience for regulated services year to date in FY 2015. These deductions include uncompensated care, contractual allowances, and assessment payments.

(b)(iii) Staffing Model

Expenses reflect staffing models that were prepared by AAMC clinicians and administrators in consultation with cardiac surgery programs at other community hospitals in Maryland, and supported by “benchmark information” provided by consultants working in the area of cardiac services planning.

**Chart 3
Staffing Projections**

	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>
<u>Administration</u>			
Management	0.5	0.5	0.5
<u>Direct Care Staff</u>			
Physician Assistant	1.1	1.1	1.1
RN	18.0	20.6	21.7
<u>Support Staff</u>			
Technical	10.2	11.5	12.3
Professional	0.5	0.5	0.5
Total FTEs	<u>30.4</u>	<u>34.2</u>	<u>36.2</u>

(b)(iv) Expense projections

Salary assumptions for hospital staff were based on AAMC’s current salary structure, by position. Fringe benefits were assumed to be 19.4% based on FY 2014 actual experience.

AAMC has partnered with Johns Hopkins Hospital in the delivery of cardiac surgical services. JHH will provide cardiac surgeon and perfusionist coverage through this partnership.

Other expense projections were prepared by AAMC clinicians and administrators in consultation with cardiac surgery programs at other community hospitals in Maryland and with “benchmark information” provided by consultants working in the area of cardiac services planning.

Consistent with revenue assumptions, incremental expenses related to cardiac surgery cases were reduced for the variable costs related to those transferred cardiac surgery cases which will become cardiac surgery cases of AAMC.

The resulting net operating expense for FY 2017, 2018 and 2019 is \$6,945,043, \$8,010,222, and \$8,473,780, respectively. Please see Table J.

Capital costs and depreciation

AAMC will be funding the capital costs associated with the project out of existing cash reserves. AAMC will incur \$2.5 million in capital costs which will be depreciated as follows:

Chart 4
Capital Costs

	Capital Costs	Depr. Life (yrs)	Annual Depr. Exp.
Renovations	\$451,000	20	\$22,550
Equipment	2,049,381	7	292,769
Total	\$2,500,381	7.93	\$315,319

Overall financial performance

AAMC is projected to generate revenues in excess of total expenses including incremental depreciation by Year 2 of the new program. The resulting income (loss) from operations for FY 2017, 2018 and 2019 is (\$1,504,222), \$15,755, \$871,330, respectively. Please see Table J. AAMC currently has a positive operating margin and is projected to maintain a positive operating margin including Year 1 of the new program and throughout the projection period.

(14) Emergency Department Treatment Capacity and Space

- (a) An applicant proposing a new or expanded emergency department shall classify service as low range or high range based on the parameters in the most recent edition of *Emergency Department Design: A Practical Guide to Planning for the Future* from the American College of Emergency Physicians. The number of emergency department treatment spaces and the departmental space proposed by the applicant shall be consistent with the range set forth in the most recent edition of the American College of Emergency Physicians *Emergency Department Design: A Practical Guide to Planning for the Future*, given the classification of the emergency department as low or high range and the projected emergency department visit volume.**
- (b) In developing projections of emergency department visit volume, the applicant shall consider, at a minimum:**
 - (i) The existing and projected primary service areas of the hospital, historic trends in emergency department utilization at the hospital, and the number of hospital emergency department service providers in the applicant's primary service areas;**
 - (ii) The number of uninsured, underinsured, indigent, and otherwise underserved patients in the applicant's primary service area and the impact of these patient groups on emergency department use;**
 - (iii) Any demographic or health service utilization data and/or analyses that support the need for the project;**
 - (iv) The impact of efforts the applicant has made or will make to divert non-emergency cases from its emergency department to more appropriate primary care or urgent care settings;**
 - (v) Any other relevant information on the unmet need for emergency department or urgent care services in the service area.**

APPLICANT RESPONSE

This Standard is not applicable to the proposed project.

(15) Emergency Department Expansion

A hospital proposing expansion of emergency department treatment capacity shall demonstrate that it has made appropriate efforts, consistent with federal and state law, to maximize effective use of existing capacity for emergent medical needs and has appropriately integrated emergency department planning with planning for bed capacity, and diagnostic and treatment service capacity. At a minimum:

- (a) The applicant hospital must demonstrate that, in cooperation with its medical staff, it has attempted to reduce use of its emergency department for non-emergency medical care. This demonstration shall, at a minimum, address the feasibility of reducing or redirecting patients with non-emergent illnesses, injuries, and conditions, to lower cost alternative facilities or programs;**
- (b) The applicant hospital must demonstrate that it has effectively managed its existing emergency department treatment capacity to maximize use; and**
- (c) The applicant hospital must demonstrate that it has considered the need for bed and other facility system capacity that will be affected by greater volumes of emergency department patients.**

APPLICANT RESPONSE

This Standard is not applicable to the proposed project.

(16) Shell Space

Unfinished hospital shell space for which there is no immediate need or use shall not be built unless the applicant can demonstrate that construction of the shell space is cost effective.

APPLICANT RESPONSE

This Standard is not applicable to the proposed project.

COMAR 10.24.17 – Cardiac Surgery Standards

.04 Commission Program Policies

A. Consideration of New Programs - (1) Cardiac Surgery

(b) Population-Based Budget Agreement

A hospital shall have a population-based budget agreement, a total patient revenue agreement, or a modified charge per episode agreement with the Health Services Cost Review Commission before a hospital's CON application to establish a cardiac surgery program will be docketed.

APPLICANT RESPONSE

A copy of AAMC's Global Budget Agreement is available at:

<http://www.hscrc.state.md.us/documents/global-budgets/Global-Budget-Revenue-Agreement-AAMC.pdf>

(c)Existing PCI Intervention Program

A hospital shall have provided both primary and elective PCI services for at least three years before filing an application for a CON to establish cardiac surgery services.

APPLICANT RESPONSE

A. Overview

AAMC has provided both primary and elective percutaneous coronary intervention (PCI) services for more than three years before filing this application and has established a high quality, high volume, and robust PCI program in less than fifteen years. Not only is AAMC one of the highest volume CPORT programs in the state of Maryland, it has exemplary door to balloon times ranking it among the best programs.

AAMC has been at the forefront of PCI expansion in Maryland. The AAMC program for emergency care of the ST Elevation Myocardial Infarction (STEMI) patient began in 2001 under the innovative Cardiovascular Patient Outcomes Research Team (CPORT) study. CPORT reflected research showing that timely, emergent care for acute STEMI patients saves lives. In 2008, AAMC joined the CPORT-E study, which was a multi-state, multi-site clinical trial. That study ultimately found that elective (non-primary) PCI could be performed safely under certain conditions and regulations at hospitals without on-site cardiac surgery.

Apart from its outstanding performance in PCI procedures, in FY 2014, The Heart and Vascular Institute at AAMC saw 20,000 patients. In addition, the hospital performed more than 1,000 cardiac catheterizations and 500 electrophysiology procedures. These high volumes and long-standing history of participation in CPORT distinguish AAMC among the busiest and most outstanding cardiac programs in the state of Maryland.

AAMC holds multiple certifications for cardiac services. The Cardiac Catheterization Labs at AAMC holds the Society of Cardiovascular Patient Care (SCPC) Certification and a Certificate of Ongoing Performance by the State of Maryland for its elective or non-primary catheterization program. AAMC also holds a waiver from the State of Maryland to perform STEMI procedures on an emergent basis. The hospital is also a designated Cardiac Intervention Center (CIC) designated by the Maryland Institute for Emergency Medical Services Systems (MIEMSS); is actively involved in Regions 3, 4, and 5; has representation on the Region 5 quality committee of MIEMSS, and works with the area EMS to support education and quality.

AAMC currently operates a strong cardiac care program incorporating primary PCI, elective PCI, and cardiac catheterization.

B. The PCI Team

AAMC has built a highly regarded cardiac care team.

Dr. Jerome Segal is Medical Director of the AAMC Heart Institute (See Exhibit 4(k) for CV) and Dr. Jonathan Altschuler is Medical Director for the Cardiac Catheterization Labs (See Exhibit 4(a) for CV). Dr. Segal has more than 20 years of experience in treating cardiovascular disease and has authored numerous scholarly articles in cardiology. He holds an academic appointment as Clinical Professor of Medicine at George Washington University and is Board-certified in cardiovascular disease, internal medicine, and interventional cardiology. Dr. Altschuler is Board-certified in interventional cardiology, cardiovascular disease, and internal medicine.

Day-to-day operations are managed by a Clinical Director and Cardiac Program Coordinator. The staff is comprised of registered nurses and cardiovascular radiological technologists who specialize in the services provided in the Cardiac Catheterization Labs.

C. Facilities and Services

The Cardiac Catheterization Labs at AAMC are available 24 hours a day, seven days a week. The staff visualize and detect heart conditions that can lead to life-threatening heart attacks. The staff also treat patients in the throes of myocardial infarctions. These latter interventions are done on an emergency basis for STEMI patients according to strict standards of Maryland, the American College of Cardiology, and the American Heart Association.

The chart below presents the volumes and outcomes of the STEMI Door to Balloon percentage for AAMC during calendar years 2013 and 2014.

Chart 5
STEMI Door to Balloon Time

Year	Volume	% < 90 min	% < 60 min	Months at 100%
2013	157	93%	71%	5
2014	165	96%	63%	7

Internal STEMI data shows that AAMC performed 157 emergency cases in CY2013, with 93% of these cases performed within 90 minutes (door to balloon time), and 71% within 60 minutes. For five months in 2013, AAMC performed 100% of emergency cases in less than 90 minutes. In 2014, 165 patients were cared for on an emergency basis with 96% of them having a door to balloon time less than 90 minutes and 63% in less than 60 minutes. For seven months in 2014, AAMC performed 100% of cases in less than 90 minutes. The excellent door to balloon times rank AAMC among the top quartile in the state of Maryland.

AAMC began providing Cardiovascular Patient Outcomes Research Team – Elective Angioplasty (CPORT E) services in 2009. In this protocol, hospitals provide elective angioplasty without cardiac surgery backup. The CPORT-E research study was completed in April 2011. AAMC now provides this service under a Certificate of Ongoing Performance issued by the Maryland Healthcare Commission. In addition, the AAMC Cath Lab staff performs

electrophysiological (EP) studies for patients with atrial fibrillation and ventricular arrhythmias in order to correct defects within the heart's electrical system.

Specific services include:

- Diagnostic cardiac catheterization for patients who, have documented evidence of significant cardiac ischemia on stress tests or patients who are symptomatic and have a very high probability of significant coronary artery disease based on other risk factors.
- Cardiac catheterization for patients who need interventional care such as balloon angioplasty or stents.
- Defibrillator insertion to those at high risk for sudden cardiac death.
- Pacemaker insertion for those with bradycardia and arrhythmias.
- Transesophageal echo (TEE) studies for those in need of a cardioversion to minimize the release of clots.
- Cardioversions for arrhythmias.
- Tilt table studies for patients with syncope issues.
- Electrophysiological (EP) studies for patients with atrial fibrillation in order to ablate the culprit area.
- Timely emergency treatment by interventional means for patients having heart attacks.

AAMC has two complete cardiac catheterization laboratories. Both are dual-function and may be utilized for PCI and EP procedures.

Cardiovascular Interventional Services at AAMC are available 24 hours per day, 7 days per week. The Cardiac Catheterization Laboratory (CCL) interventional suites are located in the Acute Care Pavilion on the 2nd floor near the operating rooms, one floor above the ED and one floor below the CCU. The CCL employs a total of 6 nurses, and 8 radiologic technologists (RT). RN's who work in the CCL, are licensed by the Maryland Board of Nursing, competent in moderate sedation, and are CPR and ACLS certified. They provide direct and indirect patient care and are expected to demonstrate clinical nursing knowledge and skill related to cardiovascular procedures while applying the nursing process supporting the Patient Centered Family Focused model of care. AAMC technologists are certified in diagnostic radiography by the American Registry of Radiology Technologists and are also certified in CPR and ACLS. They perform radiographic procedures with demonstrated ability to apply current radiological knowledge and skill. All staff members perform their duties while also being conscientious of radiation safety to allow only minimal amount of radiation exposure to themselves and their patients.

The addition of a third room will support the primary purpose of the STEMI program and the growing volume of EP services without compromising the needs of the community. The addition

of high-quality, state-of-the-art technology enables our physicians to work with improved image clarity. This technology allows AAMC to expand the number of procedures, improve quality and further decrease the length of the procedures and radiation exposure to patients and staff from those procedures. Construction of the third lab is expected to be completed by late spring 2015.

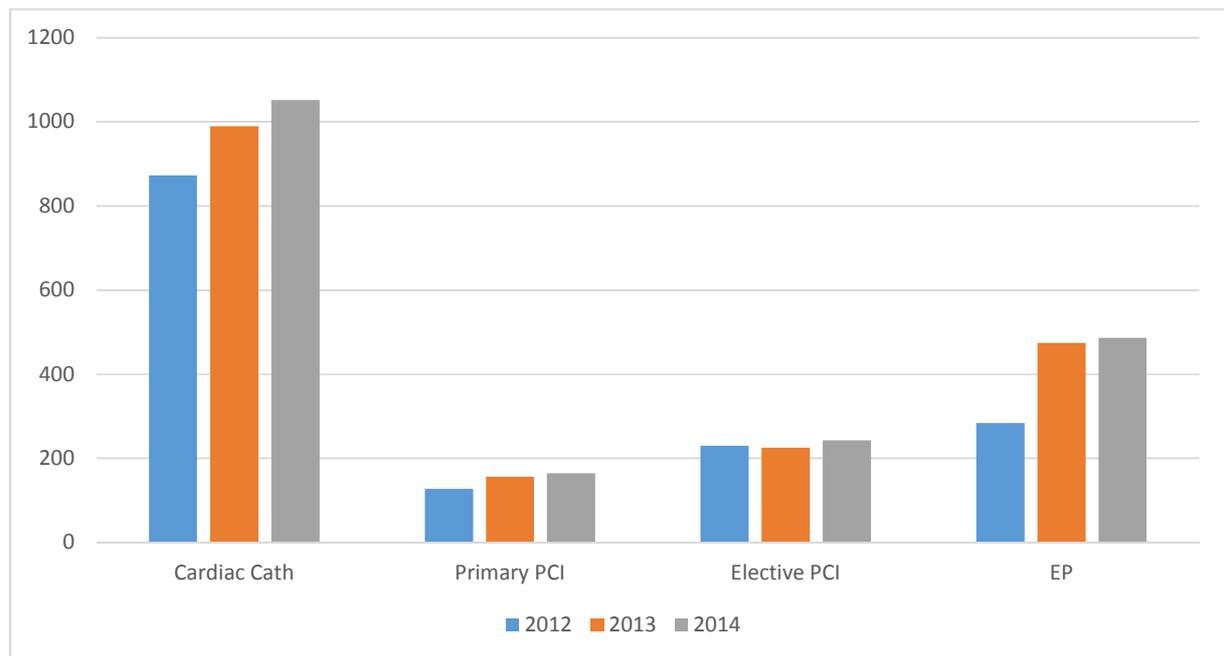
Utilization

Since 2002, AAMC has provided STEMI procedures to more than 1,500 patients.

Volumes over the past two calendar years have increased in almost every area of the cardiac cath lab. Cardiac catheterizations have grown by 20% and electrophysiological studies and device insertions have grown by 71% since 2012. As indicated above, the emergency cases continue to grow, reflecting community partnerships and increased awareness about early heart attack care.

Chart 6
STEMI Procedures

Year	Cardiac Caths	Primary PCIs	Elective PCIs	EP
2014	1052	165	243	487
2013	990	157	225	474
2012	873	128	230	284



AAMC foresees an increase in the number of patients requiring cardiac catheterization over the next five to ten years. This projection is based on general population growth in its service area as

well as the aging of the population (heart disease being the primary cause of death for those aged 65 and over).

(d) Most Recently Approved Program

A new cardiac surgery program will only be considered in a health planning region if the most recently approved program in the health planning region has been in operation for at least three years.

APPLICANT RESPONSE

Commission staff have confirmed that this criteria is met.

.05 Certificate of Need Review Standards for Cardiac Surgery Programs

(1) Minimum Volume

An applicant proposing establishment or relocation of cardiac surgery services shall document that the proposed cardiac surgery program will meet the following standards:

(a) For an adult cardiac surgery program, demonstrate the ability to meet a projected volume of 200 cardiac surgery cases in the second full year of operation; the program shall attain a minimum annual volume of 200 cardiac surgery cases by the end of the second year of operation.

APPLICANT RESPONSE

AAMC’s proposed program will meet and exceed the applicable minimum volume requirements for cardiac surgery programs. The following section presents volume projections for program years 1-3 (FY2017-2019) and the evidence to support these volume projections.

(a) Minimum Volume Standard

AAMC projects that its new cardiac surgery program, to begin operation in FY 2017, will significantly exceed the minimum volume standard of 200 cases by the end of Year 1 of program operation. The program will achieve the following performance levels in its first three years of operation:

**Chart 7
Adult cardiac surgery
Projected case volume at AAMC
Program Years 1-3
FY2017-2019**

		FY 2017 Projected Volume	FY 2018 Projected Volume	FY 2019 Projected Volume
Total Projected Adult Cardiac Surgery Volume at AAMC		241	337	387
(# discharges)				
<i>Service Area Volume at AAMC</i>		<i>223</i>	<i>312</i>	<i>356</i>
<i>Out of Area Volume at AAMC</i>		<i>18</i>	<i>25</i>	<i>31</i>
Service Area: Total Projected Market AAMC Cardiac Surgery Market Share		896 25%	888 35%	883 40%

These projections were based on multiple analyses (“supporting analyses”), each of which supports the assumptions that AAMC will far exceed 200 cases by the end of Year 1 and will maintain a cardiac surgery program of significantly greater than 200 cases going forward. These analyses examined the four major factors expected to impact program volume:

- #1 Cardiac surgery need of inpatients and outpatients currently treated at AAMC;
- #2 Volume shifts from the JHH to AAMC as a function of the collaborative AAMC-JHM cardiac surgery program at AAMC;
- #3 Cardiology market share growth at AAMC and referral redirection anticipated with a new program at AAMC; and
- #4 Cardiac surgery use rates for the service area population.¹¹

AAMC critically examined these factors through the analyses described below, producing the following evidence and conclusions:

Conclusion 1: AAMC expects to exceed the 200 case volume standard by the end of Year 1 based largely on (a) existing clinician relationships and (b) existing inpatient and outpatient hospital volume.

(a) Existing Relationships

Supporting analysis (a): Clinicians from AAMC conducted discussions with cardiologists from six cardiology practices affiliated with AAMC to document the number of cardiac surgery referrals that were made this past year from these practices and estimate the percentage of cases these clinicians expect to refer to a new program at AAMC (estimates were provided at the individual clinician level, where possible).

Findings: AAMC’s current base of affiliated cardiologists generates the volume to support a cardiac surgery program of greater than 200 cases, even after the projected use rate factor has been applied. Clinicians indicated that they would begin to refer cardiac surgery cases to AAMC’s new program in its first year of operation. Clinicians also provided estimates of cardiac surgery referrals based on the most recent practice year. These volumes are documented below. The sum total of these estimates represents a “base volume projection” for AAMC’s new cardiac surgery program, as this referral base of clinicians exists even before further growth in

¹¹ Projected use rate is calculated based on the six year average annual rate of volume change, consistent with MHCC projections, as further described in subsection (d) of this response.

cardiology market share has occurred or further clinician relationships have been formally structured.

Chart 8
“Base Volume Projection:” Volume from Existing Referral Sources

AAMC-affiliated Cardiology Practices	FY 2014 Cases	Total Projected Practice Referrals ^[2]			AAMC Estimated Share			AAMC Projected Volume		
		FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019
AAMC Cardiology Specialists	105	101	98	98	90%	90%	90%	91	88	88
Annapolis Cardiology Consultants, LLC.	105	101	98	98	90%	90%	90%	91	88	88
Chesapeake Cardiac Care, P.A.	27	26	25	25	50%	75%	75%	13	19	19
Bay Cardiology	10	10	9	9	75%	90%	90%	7	7	7
Chestertown Cardiology	55	53	51	51	25%	50%	50%	13	26	26
Cardiology Associates ^[1]	120	115	112	112	50%	75%	75%	57	84	84
Total, 6 practices only	422	406	395	393	67%	79%	79%	272	312	312

[1] Estimated based on 12 cardiologists in full time clinical practice @ 10 cases per physician per year

[2] Projections based on FY 2014 cases, adjusted for projected change in service area discharges

(b) Existing Volume at AAMC

Supporting analysis (b): Clinicians at AAMC completed an internal case review to document the number of hospital transfers and referrals for cardiac surgery arranged for hospital patients originating at AAMC during FY 2014. This represents the “existing cardiac surgery base” at AAMC.

- AAMC clinicians and administrators reviewed the case records of all inpatient and outpatient direct transfers arranged from AAMC to other hospitals for cardiac surgery. This review included all patients transferred for cardiovascular bypass surgery and valve surgery, as well as a portion of patients transferred specifically for evaluation for cardiac surgery. Clinicians assumed that 50% of those patients transferred for evaluation for cardiac surgery, in fact, received cardiac surgery.
- In addition, clinicians reviewed the case records of all outpatients undergoing cardiac catheterization in the AAMC catheterization lab who were subsequently referred for cardiac surgery or surgical evaluation. These outpatients included patients who were referred for cardiac surgery, valve surgery, or for “evaluation for cardiac surgery” The total number of cardiac surgery patients were estimated in a manner consistent with estimates for the inpatient group.
- The total number of direct transfers for surgery and the number of outpatients estimated to have had surgery following a referral represents the “existing cardiac surgery patient base” at AAMC.

Findings: AAMC’s existing cardiac surgery patient base, by itself, generates the cardiac surgery volume to nearly meet the minimum volume standard of 200 cases.

Clinicians identified a total of 237 cardiac care patients at AAMC who were transferred or referred from AAMC and assumed to have received surgery. This included 162 direct hospital-to-hospital transfers made from AAMC and 75 outpatients evaluated in the catheterization lab at AAMC and referred for cardiac surgery. Assuming that 80% of patients would remain at AAMC for their cardiac surgery if clinicians and patients had that option, **this would translate into a total of 188 hospital patients treated at AAMC who would have had their cardiac surgery at AAMC.**

Conclusion 2: AAMC and JHM surgeons expect 50% of the service area volume now served at JHH outside of AAMC volume and patient relationships – 45 cases - to shift to AAMC

Supporting analysis: Review of market data and JHH surgeons’ estimate of the program’s projected impact.

The AAMC-JHM cardiac surgery program partnership will bring several JHU faculty members to AAMC to perform surgery. With this program collaboration, patients at AAMC will be offered access to JHM surgeons at the patient’s own regional hospital, continuity of care under local cardiologists, and AAMC’s high quality of care. Except for the most complex cases, and those procedures restricted to a limited number of approved sites, JHM and AAMC clinicians expect to provide a comparable level of care for cardiac surgery across the two hospitals.

Based on this program plan, the surgical leadership at JHM and the clinicians at AAMC estimate that at least 50% of service area residents now treated at the JHH for cardiac surgery will shift to AAMC once the AAMC-JHM collaborative program is in place.

Findings:

- In CY2013, a total of 163 service area residents had cardiac surgery at the JHH. Assuming that 50% of these patients will be served at AAMC's new cardiac surgery program, AAMC can expect a total of 82 patients to shift from JHH to AAMC.
- This total volume of 82 discharges was adjusted to reflect those patients previously counted in the transfer volume (i.e., patients transferred directly from AAMC to JHH):
 - A total of 82 service area patients from JHH are expected to shift to AAMC
 - 37 patients are already documented and accounted for in the direct transfers (see above); this patient volume, now transferred to JHH, is expected to be served at AAMC; 45 *additional* service area patients are projected to shift from JHH to AAMC

This volume combines to total the 82 service area patients from JHH expected to shift to AAMC, 45 of which are in addition to patients already counted in Conclusion 1.

Conclusion 3: AAMC can expect to achieve 40% market share by Year 3 of the new program.

Once AAMC's cardiac surgery program is established, it will draw cases beyond those originating from existing clinician relationships, existing cardiac volume, and the JHM relationship.

This expectation is based on AAMC's historical performance as a provider of specialty services and its geographic location. AAMC is particularly well positioned to serve residents of Anne Arundel and the midshore counties currently isolated from local cardiac surgery hospitals.

Supporting analysis/evidence:

- AAMC currently draws 40% market share for its joint replacement program and 32% market share for its bariatric surgery program across the defined service area. This is particularly striking given the existence of other program providers for these elective procedures across the region.

- Cardiac surgery at AAMC is likely to draw comparable if not higher market share given that there are no local providers for cardiac surgery in the area, and given that AAMC is a dominant provider of cardiac services for Anne Arundel County residents.

Conclusion 4: AAMC can expect additional volume from out-of-area patients (“in-migration”), consistent with its draw of out-of-area patients for PCI and for its total hospital patient base.

Supporting analysis: Patient origin analysis of AAMC’s PCI patients and hospital transfers for cardiac surgery (the representative population for this analysis) shows that 8% of AAMC’s inpatients come from out of area.

Based on this analysis, the projected cardiac surgery volume at AAMC incorporates out of area volume to represent 8% of total cardiac surgery volume.

Conclusion 5: Based on projected use rate and population growth, and a 40% target market share, AAMC is expected to grow to nearly 400 cases by Year 3 of the new program.

- Based on these combined analyses, AAMC prepared a base projection, simulating a fully implemented program (at 40% market share) using FY 2014 volumes. This is referred to as “FY2014 Estimated Achievable Volumes” and is shown on Chart 24. AAMC then projected its cardiac surgery volume for FY 2017-2019 (program years 1-3) to reflect:
 - Projected market volume, based on projected population and projected use rates for the defined service area during the projection period; and
 - Ramp up of AAMC’s market share from 25-40% market share.

AAMC’s new program is expected to achieve 387 cases by FY 2019.

(b) “Reasonableness Test” for Market Share Target

The performance levels projected for AAMC are premised on achieving a 25% market share for cardiac surgery across the defined service area by the end of the program’s first year of operation, and 40% market share for the defined service area by the end of the program’s third year of operation. These assumptions were tested against (1) AAMC’s current “market share equivalent” for cardiac surgery (i.e. AAMC’s existing patient base of hospital transfers and hospital referrals) and (2) AAMC’s current market share for specialty programs to provide benchmarks of achievable market share.

Findings:

- AAMC's current market share equivalent of cardiac surgery = 19% market share
 - AAMC's existing patient base of hospital transfers and hospital referrals for cardiac surgery translates into the market share equivalent of 19% of the cardiac surgery market in the defined service area.
 - AAMC currently captures nearly 20% market share for inpatient PCI services in the defined service area. AAMC expects further growth in its PCI market share once AAMC becomes recognized as a full service provider and can assure surgical back-up for more complex PCI cases.
- Projected volume shifts from JHH = Represents an additional 4% to 5% market share
 - The program collaboration with JHM is expected to result in volume shifts to AAMC. An estimated 50% of service area patients now treated at JHM are expected to shift to AAMC, for an equivalent of 4 to 5% market share. This expectation is corroborated by projections from area cardiologists who now refer directly to the JHH and have expressly indicated that they plan to redirect a significant number of cardiac surgery referrals to AAMC.
 - Newly affiliated AAMC physician practices in Kent County are expected to further enlarge AAMC's patient base, and support AAMC's overall cardiac surgery market share growth to achieve 25% share.
- Market share growth: AAMC experience of 24% to 40% market share
 - AAMC documents a 24% overall inpatient market share in the region (adults only) and it has achieved greater than 40% market share in its joint replacement program and 32% market share in its bariatric surgery program, even as these clinical areas are highly competitive.
 - AAMC will be the only cardiac surgery provider within a 60 minute drive for thousands of area residents. This is expected to result in market share performance of at least 25-30%.
 - Based on the above calculations and benchmarks, a 25% market share will be readily attainable in Year 1 of the program through AAMC's existing hospital volume and AAMC's existing referral base. By Program Year 3, AAMC will achieve a 40% market share for cardiac surgery as the program gains recognition and as AAMC's own patient base for PCI and general cardiology further expands.
 - Market share will be further supported by payer-provider contracts that channel books of business to high quality, low cost providers. AAMC is already pursuing contracting models such as this one for other specialty services.

Based on these assumptions, the total number of cardiac surgery cases at AAMC is projected to easily exceed the 200 minimum volume standard.

Accounting for use rate

AAMC accounted for the projected use rate in its performance projections. AAMC will exceed the 200 minimum volume standard in FY 2018-2019 even as changes in use rates occur.

- AAMC projected the size of the cardiac surgery market in FY 2017-2019 based on the methodology specified in COMAR regulations for specialized cardiac services.
 - Based on the 6 year historical period (CY2008-2013), the average annual change in use rate was calculated and applied to the projected population for each segment of AAMC’s defined cardiac surgery service area to project the total market volume for:
 - Baltimore Upper Shore portion
 - Washington Metropolitan portion
- AAMC then applied the achievable market share figure to the projected market in FY 2017-2019 to project cardiac surgery volumes in FY 2017-2019 (assuming a ramp-up of market share from 25% to 40% by FY 2019) (see Appendix 2 - “Technical Notes”).

AAMC’s projected performance level will remain well above the 200 minimum volume standard through FY 2019, even as the total market of cardiac surgery cases changes.

Chart 9
Adult Cardiac Surgery
Projected Case Volume at AAMC
FY2017-2019

	FY 2017 Projected Discharges	FY 2018 Projected Discharges	FY 2019 Projected Discharges
<i>Population: Service Area</i>	895,406	903,917	912,810
<i>Cardiac Surgery Use Rate: Per 100,000</i>	100.1	98.3	96.7
<i>Projected Service Area Volume</i>	896	888	883
<i>AAMC Volume: Ramp up to 40% market share of service area</i>	25%	35%	40%
AAMC Service Area Volume	223	312	356
<i>Out of Area Volume (8% of total)</i>	18	25	31
Total Projected Adult Cardiac Surgery Volume	241	337	387

(b) Minimum Volume Standard - Pediatric

NOT APPLICABLE

(c) Minimum Volume Standard - Combined Pediatric and Adult

NOT APPLICABLE

(d) Consistency with MHCC Utilization Projections

AAMC examined its volume projections in the context of the most recently published projections for the Baltimore Upper Shore Planning Region and the Washington Metropolitan Region. The analysis demonstrated that the addition of a new cardiac surgery program at AAMC will not result in any existing provider of 200+ cardiac surgery discharges to decline below 200 cases. In other words, the total volume projected for hospitals in the Baltimore Upper Shore and for the Washington Metropolitan Region **will allow for an additional cardiac surgery provider to serve the Anne Arundel and midshore counties without causing any existing provider's volume to decline below 200 discharges. (See Section 6(b): "Need" for full analysis)**

The volume projections reflect an analysis of both the Baltimore Upper Shore Health Planning Region and the Metropolitan Washington Health Planning Region from which AAMC expects to draw the majority of its patients.

Volume projections - The volume projections prepared are based on a service area definition that incorporates communities in both the Baltimore Upper Shore Region and the Metropolitan Washington Region, and a population-based projection based on the use rate projection methodology required by COMAR Regulation .08 to project total cardiac surgery volume. More specifically:

- AAMC defined a service area that incorporates 5 counties from within the Baltimore Upper Shore region, and segments from 2 counties of the Washington Metropolitan region.
- AAMC adopted a population-based projection model specific to this zip code-defined service area to project total case volume for this service area ("market size"). AAMC projected the total number of cardiac surgery cases for this defined service area based on the 6 year average annual percentage change in historical use rates for this defined service area, and applied the age cohort-specific use rate formula prescribed in the COMAR Regulation .08 to project total cardiac surgery case volume for this defined service area.

- AAMC applied assumptions about AAMC market share to reflect the impact of competitors and to reflect outmigration that must be expected for this defined service area. The methodology adopted is summarized in Appendix 2 - “Technical Notes”.

Projections for the Health Planning Regions - Outlined below are a number of points that address the consistency with the utilization projections recently published and the challenges to these projections:

- Data sources
 - Both the published regulations and the AAMC analysis were based on an integrated dataset for Maryland hospitals (HSCRC Discharge Abstracts) and Washington, DC hospitals (DCHA discharge database). Both the published regulations and the AAMC analysis were based on adult discharges only (age 15+ years old).
- Use rate for service area
 - The AAMC analysis applied the prescribed age cohort-specific use rate formula to the zip code-defined service area based on the 6 year average annual change in use rates (CY2008-2013) for the Baltimore Upper Shore and the Washington Metropolitan portions of the defined cardiac surgery service area. This prescribed formula was used to project total case volume (total market volume) for the service area.
- Market share assumptions for AAMC
 - AAMC applied a target market share of 25-40% for the service area to the total projected market of cardiac surgery discharges for each projection year. Market share assumptions reflect competitor activity and in this way accounted for “outmigration.”
 - AAMC projected that 8% of total cardiac surgery discharges would be accounted for by “in-migration” of patients residing outside of the defined service area. This was based on patient origin of AAMC’s patient base for PCI and patient origin of AAMC’s overall patient base.

(2)Impact

- (a) A hospital that projects that cardiac surgery volume will shift from one or more existing cardiac surgery hospitals as a result of the relocation or establishment of cardiac surgery services shall quantify the shift in volume and the estimated financial impact on the cardiac surgery program of each such hospital.**
- (b) An applicant shall demonstrate that other providers of cardiac surgery in the health planning region or an adjacent health planning region will not be negatively affected to a degree that will:**
 - (i) Compromise the financial viability of cardiac surgery services at an affected hospital; or**
 - (ii) Result in an existing cardiac surgery program with an annual volume of 200 or more cardiac surgery cases and an STS-ACSD composite score for CABG of two stars or higher for two of the three most recent rating cycles prior to Commission action on an application dropping below an annual volume of 200 cardiac surgery cases; or**
 - (iii) Result in an existing cardiac surgery program with an annual volume of 100 to 199 cardiac surgery cases and an STS-ACSD composite score for CABG of two stars or higher for two of the three most recent rating cycles prior to Commission action on an application dropping below an annual volume of 100 cardiac surgery cases.**

APPLICANT RESPONSE

AAMC determined that the new program will not result in any existing provider of cardiac surgery reporting 200+ cases to drop below the 200 cases, nor will it compromise the financial viability of programs currently operating with annual volumes of 200+ cases. A summary of this section is as follows:

- (1) The AAMC cardiac surgery program will not have a significant financial impact on the existing cardiac surgery programs with the resulting shift of projected volumes from those organizations (primarily JHH, the University of Maryland Medical Center, and the Washington Hospital Center) to AAMC.
- (2) In FY 2018, the second year of operation for the AAMC cardiac surgery program, there are projected to be 337 cardiac surgery cases relocated from cardiac surgery hospitals in Maryland and DC to the AAMC program. Only three hospitals - termed the "Competing Hospitals" - will have more than 10 relocated cases (WHC, JHH and UMMS).

- (3) No Maryland hospital that currently serves more than 200 cardiac surgery cases is projected to decline below 200 cardiac surgery cases after the full implementation of the AAMC cardiac surgery program.
- (4) No Maryland hospital that currently serves between 100 and 190 cardiac surgery cases is projected to decline below 100 cases upon the full implementation of the AAMC cardiac surgery program.
- (5) The impact of the AAMC program on the costs per case and the charges per case of each of the Competing Maryland Hospitals is small, less than a 0.1% increase in all cases, with no projected impact on the hospital's net income from operations.

a) Financial Impact on Existing Cardiac Surgery Providers

The project will impact few existing providers, and this impact will not have a substantial adverse effect on the financial viability of the cardiac surgery programs at these hospitals.

In FY 2018, the AAMC cardiac surgery program will be fully operational, providing cardiac surgery services to 337 patients. It is anticipated that these cases will be drawn from hospitals with cardiac surgery programs operating in both Maryland and the District (DC), as set forth below. From Chart 10 depicts the projected number of relocated cardiac surgery cases with the majority of those cases coming from three hospitals – JHH, University of Maryland Medical System and Washington Hospital Center. We have termed these three hospitals the Competing Hospitals.

Chart 10
Projected Cases Relocated from other Hospitals
FY 2018
Relocated Cases

Hospital	Total	Medicare	Non-Medicare
Johns Hopkins	69	36	33
University of MD	29	16	13
Washington Adventist	6	3	3
Other Maryland	6	1	5
<i>Subtotal- Maryland</i>	<i>110</i>	<i>56</i>	<i>54</i>
Washington Hospital Center	221	111	110
George Washington University Hospital	6	5	1
<i>Subtotal - DC</i>	<i>227</i>	<i>116</i>	<i>111</i>
Total	337	172	165

The financial impact of the AAMC program on each of the Competing Hospitals will depend primarily on two factors:

- The location of the Competing Hospital, i.e. Maryland or Washington, DC
- The number of cases that will be relocated from the particular Competing Hospital to the AAMC program

The Effect of Location – Impact on Maryland Hospitals

In Maryland, hospitals are subject to the Maryland All-Payer Model Agreement (the Demonstration), an Agreement between the Office of the Governor of Maryland, the Center for Medicare and Medicaid Services, the Health Services Cost Review Commission (HSCRC) and the Maryland Department of Health and Mental Hygiene.

In order to implement the Demonstration in accordance with its terms and conditions, the HSCRC has placed most Maryland hospitals on a payment arrangement involving hospital-specific target budgets. These target budgets are increased annually by an inflation factor that accounts for the impact of general inflation in the economy on the costs of goods and services used by hospitals to provide patient care. The target budgets are also increased annually by demographic adjustments that account for the projected impact on hospital service levels of demographic changes in the patient service area of the hospitals.

In the case of a hospital that receives CON approval for a new service, it is anticipated that market volume for the new service will shift, with patients relocating from other Maryland hospitals to the hospital with the CON program. While the HSCRC does not have fully established policies to adjust a hospital's target budget for a CON program or firm policies to reduce the target budgets of the hospital with patients relocated to the CON, it is likely that the reductions will take the form of market share adjustments (MSAs). These MSAs are intended to reduce the hospital's target budget by 50% of the charges that the hospital would have made to its relocated patients treated by the CON program

For example, if the relocated patients of a hospital represented \$1,000,000 in the charges for the hospital's services, the adjustment to the hospital's target budget relative to the CON would be \$500,000, representing 50% of the \$1,000,000 in foregone charges. The remaining \$500,000 not included in the reduction to the target budget is maintained by the hospital to cover the fixed costs of the services that were relocated to the new CON-approved program.

While the fixed costs of a particular hospital service will vary from one service to the next and will also vary between hospitals (especially between small hospitals such as Critical Access

Hospitals (CAHs) and large hospitals, such as AMCs), the use of a 50% multiplier in the MSA is intended to leave whole the hospital which experiences relocated cases to a CON-approved hospital or which loses market share for other reasons. The key point is that the 50% of foregone charges that remains with the hospital is intended to provide payments that cover the fixed costs of the hospital's relocated service. This means that the HSCRC policy is designed so that there will be no adverse financial impact on a Maryland hospital as a result of the hospital losing patients to AAMC's cardiac surgery program. Therefore, the existing cardiac surgery hospitals operating in Maryland would be expected to have no reduction in their net income from services as a result of cardiac surgery volume shifting to AAMC. (This, of course, assumes that the affected cardiac surgery hospitals will manage the costs of their cardiac surgery service appropriately.)

The Effect of Location – Impact on Washington, DC

In Washington, DC, each cardiac surgery hospital is paid for Medicare cases in accordance with the Medicare Inpatient Prospective Payment System (IPPS), and for most of the hospital's other cardiac surgery cases on a comparable per case basis using diagnosis related groups (DRGs). Unlike the HSCRC system, the hospital payment arrangements in Washington, DC do not include market share adjustments that would increase the hospital's rates fractionally based on the relocation of cardiac surgery cases to the AAMC cardiac surgery program. This means that the WHC would be expected to lose all of the revenue associated with the 221 relocated cardiac surgery cases while reducing its costs by only the variable costs of the relocated cases.

b) Impact of Volume Shifts on Remaining Volumes at Other Existing Cardiac Surgery Programs

This section presents the projected number of cardiac surgery cases, by hospital, expected to be relocated to the AAMC cardiac surgery program and evaluates the effects of these relocations on Maryland's cardiac surgery programs.

AAMC quantified the projected shift in patient volume and determined that the new program will not result in any existing provider currently reporting 200 or more cardiac surgery cases to drop below 200 cases, nor will it cause any provider with 100-200 cases to drop below an annual volume of 100 cases. AAMC also assessed the financial impact to conclude that the new program at AAMC will not compromise the financial viability of programs currently operating with annual volumes of 200+ cases.

AAMC projected its case volume for cardiac surgery and the projected shift by hospital, by payer, based on the following assumptions:

- AAMC will retain 80% of existing volume at AAMC that is currently transferred/referred for cardiac surgery.
 - FY2014 actual transfer volume from AAMC provided the basis for projecting volume shifts by hospital and by payer (Medicare and non-Medicare).
- The AAMC-JHM collaborative program will redirect 50% of the service area volume currently treated at JHH to AAMC by offering local access to a JHM surgeon and providing continuity of care through AAMC cardiologists.
 - CY2013 volume of service area residents currently being served at JHH provided the case count and payer mix for volume projected to shift from JHH.
 - AAMC will maintain and develop clinician relationships in the defined service area, including those clinicians with cardiology practices who currently direct a significant percentage of cardiac surgery referrals to the Washington Hospital Center.
 - AAMC will see an increase in PCI market share as a result of having a cardiac surgery program. Physicians and patients who previously have not selected AAMC for PCI due to lack of cardiac surgery back-up are expected to utilize AAMC, thereby expanding the patient base for cardiac surgery.
 - The additional volume projected to shift from other hospitals is assumed to mirror the distribution of AAMC's transfer cases, by hospital. This is based on the assumption that a comparable base of referring physicians will be supporting the AAMC program as it grows.
- AAMC will continue to draw 8% of its cardiac volume from outside the defined service area, consistent with AAMC's current out-of-area draw for medical cardiology and PCI volume, and consistent with AAMC's current mix of transfer cases for cardiac surgery.
- This out-of-area volume is projected to accompany service area volume shifts from each of the hospitals. In other words, out-of-area volume is projected to correspond to the hospital mix of cases from each hospital, as projected in the earlier categories.

Based on a close examination of current volume in each of these categories, the projected shifts are primarily volume shifts from the Washington Hospital Center and from AAMC's program partner, the JHH, reflecting the explicit program objectives and the assumptions defined above. The chart below reflects those shifts by hospital.

Chart 11
NUMBER OF DISCHARGES PROJECTED TO SHIFT TO
AAMC, BY HOSPITAL
Based on CY2013 volumes

HOSPITAL	Estimated volume shift based on CY2013	Projected volume shift, with use rate FY2018
Washington Hospital Center	271	221
Johns Hopkins Hospital	85	69
University of Maryland Medical Center	35	29
George Washington University Med Center	7	6
Washington Adventist	7	6
Sinai Hospital	3	3
Union Memorial Hospital	2	2
UM St Joseph Med Center	1	1
Prince George's Hospital Center	0	0
TOTAL PROJECTED SHIFT	411	337

Key observations about the shifts indicated above:

- (a) *The impact of AAMC's new program will be limited largely to the highest volume cardiac surgery hospitals* - As noted, AAMC's projected volume is expected to shift primarily from the WHC and the JHH, with a more modest volume shift from the University of Maryland Medical Center. Each of these programs has been operating a high volume cardiac surgery program of more than 800 cases per year. Therefore, the projected volume shift would represent less than 9% of CY2013 cases at JHH and less than 5% of cases at the University of Maryland Medical Center. Even the largest projected shift, from the WHC, represents less than 20% of the hospital's cardiac surgery volume, and it is a program that reportedly treats more than 1,400 cases annually. Even with this projected volume shift, WHC would remain the highest volume program in the region. The new program at AAMC is not expected to result in any of the Maryland or Washington, DC-based programs that currently operate with 200+ cases to drop below an annual volume of 200 cardiac surgery cases.

Chart 12
IMPACT ON EXISTING PROVIDERS
Adult Cardiac Surgery Volume, by Hospital
Impact in CY2013 Terms

	CY2013 Actual Cardiac Surgery Cases	CY2013 Projected Shift	Percent Shifted	Resulting Volume
Washington Hospital Center	1,447	271	18.7%	1,176
Johns Hopkins Hospital	1,060	85	8%	975
University of Maryland Medical Center	810	35	4.3%	775
George Washington University Medical Center	96	7	7.3%	89
Washington Adventist Hospital	321	7	2.2%	314
Sinai Hospital	343	3	0.9%	340
Union Memorial Hospital	573	2	0.3%	571
UM St. Joseph Medical Center	296	1	0.3%	295
All Other Hospitals	674	-	-	674
TOTAL	5,620	411	7.3%	5,209

Sources:

- (1) HSCRC Discharge Abstracts
- (2) DCHA Discharge Database

- (b) *There will not be duplication for the highest complexity/tertiary procedures* - The three highest volume hospitals—WHC, JHH, and University of Maryland Medical Center—are expected to continue offering certain procedures that AAMC will not provide, including heart transplants and left ventricular assisted device procedures (LVAD). This volume will continue to support the financial strength of existing cardiac surgery programs, and underscores the fact that the new program at AAMC will not duplicate these specialized program resources.
- (c) *The financial impact on area hospitals is expected to be modest* - The projected volume shifts are not expected to compromise the financial viability of any of these large cardiac surgery programs. Based on the projected volume shifts presented above, and assumptions about market share adjustments, a financial analysis was prepared to demonstrate this point (see analysis below).
- (d) *Washington DC hospitals continue to retain a large number of Maryland patients, even with the project* – The impact analysis presented above examines the effect of a new program on those programs that have served 100+ cases/year. This analysis does not

address the impact of a new program on Prince George's Hospital Center, which has served fewer than 20 cases/year in CY2012 and in CY2013. While AAMC acknowledges that Prince George's Hospital Center has submitted a Certificate of Need application that includes a plan to grow its cardiac surgery program to the minimum volume standard, the impact analysis presented here does not address the impact of AAMC's new program on a *potentially* larger program at Prince George's Hospital Center.

At the same time, it is worth noting that there remains a substantial volume of cardiac surgery volume at the WHC from Prince George's County residents—even after the projected shift to AAMC. In other words, there remain a considerable number of Prince George's County residents now being served at the WHC, volume that might otherwise support a cardiac surgery program based at Prince George's Hospital Center.

Impact of New Program at AAMC for Patients

The Current Environment

- **Significant number of hospital transfers from AAMC and disjointed care management** - In FY 2014, AAMC identified 237 patient transfers or referrals arranged for patients who required cardiac surgery or evaluation for cardiac surgery; more than half of these patients (162 patients) required direct hospital-to-hospital transfer. This transfer volume included:
 - 143 inpatients who required direct hospital transfer from AAMC to another hospital
 - 19 outpatients who required direct hospital transfer from AAMC to another hospital following a diagnostic procedure in AAMC's catheterization lab

Thus, while AAMC serves as one of the highest volume cardiac care providers in the state of Maryland, it has had to arrange immediate hospital transfers for 162 hospital patients this past year, resulting in delays/disruptions for patients, disjointed care management, transport expenses, and the added costs of repeated assessments associated with transferred patients.

- **High costs of care** – In CY2013, nearly half of the cardiac surgery patients from this service area were treated at the two academic medical centers (428 cases), where the average cardiac surgery case rate is more than 50% higher than the average charge for cardiac surgery at community hospital providers for a comparable case mix. And based on a claims analysis prepared by a third party vendor, payment rates to the WHC are estimated to be 35% higher relative to community hospitals in Maryland. The absence of a local area cardiac surgery site in Anne Arundel County has produced this heavy

reliance on Maryland's two academic medical centers and the WHC for cardiac surgery. This has resulted in significantly higher costs of care for cardiac surgery for the Baltimore Upper Shore/Washington Metropolitan population.

The heavy reliance on Maryland's most expensive facilities has serious consequences. The high charges at these three hospitals translate into higher premiums for private payers and higher costs for patients. In addition to facing rising premiums, patients are expected to bear an increasing percentage of hospital charges through higher copayments. The high charges for cardiac surgery, then, have major consequences for patients going forward. A lower cost hospital is critical to residents of Anne Arundel County and midshore communities.

- **Burdensome travel time for patient and families** - In CY 2013, approximately 150 of the cardiac surgery patients from the defined service area travelled one hour or more to the cardiac surgery hospital where they were treated. This would include patients from Talbot, Caroline, Kent, and Queen Anne's counties who travelled to cardiac surgery hospitals in Baltimore City, Baltimore County, and Washington, DC. A recent study has shown a correlation between travel time and mortality rates for coronary artery bypass graft (CABG) surgery, understood to reflect that patients/patients' families are burdened by travel time, and that this may affect health status, compliance, and general well-being.¹²

Positive Impact of the Proposed Project

The proposed cardiac surgery program at AAMC responds directly to these issues and will yield the following benefits:

- Avoid the need to transfer approximately 150-200 patients/year from AAMC to another hospital for cardiac surgery, and strengthen continuity of care for surgical patients.
 - Maintain a single clinical management team and minimize the clinical risks/downsides associated with hospital transfers; improve quality of care by improving continuity of care
 - Improve quality of care/patient satisfaction for patients and their families by integrating care at one service site and eliminating the disruptions/delays associated with transfers
 - Reduce duplication and costs associated with hospital transfers and repeated diagnostics

¹² Chou, S et al. "Travel Distance and Health Outcomes for Scheduled Surgery," *Medical Care* 52:3 (2014). (Exhibit 7(b)).

- Remove delays/barriers to timely care that are now associated with patient transfers
 - Increasingly, patients requiring transfer from AAMC to another hospital for cardiac surgery have been delayed due to lack of an intensive care bed or denied due to patient’s insurance status (see Exhibit 7(a)).
- Provide greater access to new treatment modalities and clinical protocols by extending JHM-sponsored programs more directly to this region
 - Leverage JHM surgical manpower across the region and extend JHM-sponsored research protocols and new technology
- Provide a lower cost alternative for cardiac surgery and reduce the per capita costs of specialty care for Maryland residents by shifting volume
 - From Washington, DC hospitals to AAMC
 - From academic medical centers to AAMC

AAMC will operate as one of the lowest charge cardiac surgery providers in the state of Maryland on a case mix adjusted basis, reflecting its comparatively low rate structure. This assertion is demonstrated by comparing AAMC’s Fiscal Year 2014 actual average charge per case at a CMI of 1.0 to current cardiac surgery providers.

Chart 13
Total Hospital Average Charge per Case Comparison
FY 2014

<u>Hospital</u>	<u>Charge per Case @CMI = 1.00</u>
University of MD Med Center	\$20,427
Johns Hopkins Hospital	\$19,929
Prince George’s Hospital Center	\$15,561
Western MD Medical Center	\$14,507
MedStar Union Memorial	\$14,360
Sinai Hospital	\$14,123
Washington Adventist Hospital	\$13,771
Peninsula Regional Medical Center	\$11,777
Suburban Hospital	\$11,327
UM St Joseph Medical Center	\$11,301
Anne Arundel Medical Center	\$10,962

Source: HSCRC Discharge Abstracts

Anne Arundel’s charge per case for cardiac surgery is derived from its average charge per case at a CMI of 1.0 (\$10,962) and the average case mix of non-AMC OHS providers (3.4209) as \$37,501:

$$\$37,501 = \$10,962 * 3.4209$$

This average charge per case, multiplied by the projected AAMC case load in FY 2018 (337) produces the baseline charges (\$12,637,837) for the AAMC target budget in FY 2018.

$$\$12,637,837 = 337 * \$37,501$$

These baseline charges are then reduced by the estimated charges of AAMC’s cases that are transferred to OHS hospitals to be evaluated for cardiac surgery (\$1,489,856) and the resulting charges (\$11,147,981) further reduced by 15% to derive the FY 2018 adjustment to the hospital’s target budget under the GBR (\$9,475,784):

Baseline Charges FY 2018	\$12,637,837
Transfer Cases	<u>1,489,856</u>
Net Charges	\$11,147,981
Adjustment Factor	<u>0.85</u>
GBR Target Budget Adjustment FY 2018	\$9,475,784

This GBR target budget (\$9,475,784) requires AAMC to realize savings of \$2,892,053 measured relative to the AAMC baseline charges (\$12,637,837):

$$\$2,892,053 = \$12,637,837 - \$9,475,784$$

These savings are in addition to the savings attributable to AAMC’s favorable charge per case at a CMI of 1.0, the \$10,962 amount specified on Chart 13.

- Reduce travel time for an aging and/or frailer patient population and improve longer-term clinical outcomes by providing local access to a comprehensive cardiac care program.
 - By CY2020, the elderly population in Anne Arundel County and the midshore counties is projected to comprise 17% of the total population. Thus, driving time for residents from this region will become of increasing concern, as many more cardiac patients will be those in the elderly cohort.

In addition, clinicians project that an increasing percentage of elderly patients are likely to qualify for cardiac surgery as new technology/new surgical techniques permit the more fragile population to qualify for surgery. A service site at AAMC will respond to the need to minimize travel time for this more fragile cardiac surgery population.

Support more effective care management for residents of this region – The program at AAMC will assure this population of more than 800,000 adult residents with local access to a comprehensive program under a single clinical management team. The program is expected to support effective care management, strengthen compliance, and support patient/family well-being. The new program at AAMC will provide the continuum of cardiac care services, including pre-operative, surgical, and post-operative hospital care, physician services, cardiac rehabilitation, and support services under a single clinical management team.

Please also refer to further discussion on the favorable impact on the Total Health Care Spend savings with relocation of volumes to AAMC that is presented in the Preference in Comparative Review Section - COMAR 10.24.17.05 (8) of this application document.

(3) Quality

- (a) An applicant shall demonstrate its commitment to provide high quality health care. An applicant seeking to establish cardiac surgery services shall have utilization or peer review and control programs with regularly scheduled conferences to:**
- (i) Establish protocols that govern the referral, admission, and discharge of cardiac surgery patients;**
 - (ii) Establish and review a list of indications and contraindications to govern selection of patients for cardiac surgery;**
 - (iii) Establish a program to educate patients about treatment options;**
 - (iv) Establish mechanisms for monitoring long-term outcomes of discharged patients.**
 - (v) Review morbidity and mortality rates and other indicators of patient outcomes, and compliance with established processes of care as compared with regional or national averages;**
- (b) Prior to first use approval, an applicant shall provide documentation of (i)-(iv).**

APPLICANT RESPONSE

AAMC's commitment to the highest quality health care is evident in its many awards and recognitions. These include:

- The 2013 and 2014 Delmarva Foundation Excellence Awards for quality improvement achievements
- Magnet Recognition through the American Nurses Credentialing Center
- The 2012 Leapfrog Top Hospital Recognition
- The 2011 American College of Cardiology Foundation's NCDR ACTION Registry–GWTG Gold Performance Achievement Award
- Recognition by the Institute for Patient and Family-centered Care
- National accreditation and recognition for its Breast Center, Weight Loss Program, Chest Pain Program, Cancer Center, Stroke Center, Pathways Substance Abuse program, and other clinical programs

AAMC's quality programs that operate throughout the organization are integrated and collaborative. Each department has active quality improvement teams, whose efforts and accomplishments are reported up through Executive Quality Council (EQC), Medical Staff Quality Review Committee (MSQRC), and Board of Trustees Quality and Patient Safety Committee. AAMC utilizes the Global Trigger Tool model of the Institute for Healthcare Improvement as well as its own programs for clinical outcomes analysis. Ongoing committees for pharmacy and therapeutics, clinical resource management, risk management, medical

education, medical staff peer review, and infection control coordinate their work to ensure a seamless quality program structure.

AAMC's reputation for high quality cardiac care has been recognized through its designation as a Cardiac Intervention Center by the Maryland Institute of Emergency Medical Services System (MIEMSS) and designation as a Chest Pain Center with PCI by the Society of Cardiovascular Patient Care.

In addition, AAMC's high-volume participation in the Atlantic CPORT, CPORT-E, and Cath PCI Registry of the National Cardiovascular Data Registry (ACC-NC DR) reflects the capabilities of its cardiology program and its Quality and Patient Safety Department.

The approach to Quality Improvement Initiatives for cardiac surgery will be multi-faceted and will be done in conjunction with quality committees at the JHH.

The maintenance of high quality cardiac surgery outcomes will begin with appropriate patient selection and the performance of the correct surgical procedure in a safe and timely manner. The selection of patients and operative procedures will be done in a manner consistent with good clinical practice based upon AHA/ACC guidelines as well as the usual and customary practice employed at the JHM Division of Cardiac Surgery. Post-operative management will be based upon established protocols and pathways in place at JHM.

AAMC's cardiac surgery program will participate in the Society of Thoracic Surgeons (STS) database, as its Thoracic Surgery program does now. The program will have its own unique program identification. There will be a single individual responsible for the collection and submission of data hired by AAMC and JHU with protocols already in place at JHU. Quarterly and annual reports will be reviewed by the AAMC Cardiac Surgery Advisory committee independently and in conjunction with the leadership of JHU on a regular basis.

AAMC's cardiac surgery program will also participate in the Maryland Cardiac Surgery Quality Initiative (MCSQI). This is a collaborative statewide program begun independently in 2014 by the cardiac surgery programs in the State of Maryland. The goal of the program is to share data amongst all of the programs in the State, identify best practices, and help all programs in the State of Maryland achieve the highest quality outcomes in a cost effective fashion.

Cardiology Quality Committees

A robust leadership and operational structure already exists at AAMC to address the needs of its current interventional cardiology program. These entities illustrate the level of organization and quality control already present in AAMC's cardiology program. Most will expand to incorporate

the needs of the cardiac surgery program. They are described below, followed by specific accountability for each requirement in this standard.

Emergency Department – Cardiac Catheterization Lab Quality Committee

The Emergency Department – Cardiac Catheterization Lab Quality Committee meets on a quarterly basis. The purpose of the committee is to promote quality and teamwork amongst EMS, the ED and the CCL by reviewing and analyzing specific patient cases for continuous quality improvement by the following:

- Evaluate, monitor and disseminate key quality outcome indicators
- Utilize evidence based practice such as the ACS guidelines to develop protocols and standard operating procedures in the care of patients across the cardiac continuum
- Educate and consult with health care providers at all levels regarding care of patients
- Develop and implement quality improvement measures

Emergency Department – EMS Quality Committee

The EMS Quality Committee meets on a quarterly basis and is dedicated to improving the processes and relationships with cardiac patients. The Cardiac Program Coordinator is a member of this committee and has the responsibility of communicating outcomes of door to balloon metrics, keeping EMS updated regarding certifications and requirements from the certifications, outcomes of referrals, field activations and suggestions for improvements along with positive feedback.

In addition, STEMI, Stroke and AMI core measures data and metrics are shared with EMS through this quality committee. Open forum discussions and formal educational offerings occur through the committee and help improve the capabilities of EMS team members. EMS representatives in attendance are from MIEMSS Region 3, Region 4 and Region 5 which are all serviced by AAMC.

Cardiology Mortality & Morbidity Meeting, Elective and Primary PCI

The Cardiology M&M Elective and Primary PCI group meets on a monthly basis. The primary purpose of this meeting is to provide case conferences with ECG's and Cine films. The group reviews cases that did not meet system goals or resulted in an adverse event or outcome. Opportunities to improve medical and interventional management are discussed by cardiologists from across the organization.

Cardiology Conference

The Cardiology Conference meets weekly, except the week that Cardiology M&M/Primary PCI meetings are held. This meeting is a didactic and interactive meeting that provides AMA/CME credit. The format is arranged to cover a variety of contemporary topics across the range of cardiovascular disease, and the conference is open to all cardiology staff.

Cardiology Advisory Council

The Cardiology Advisory Council meets on a quarterly basis with representatives from across the continuum of care of the Cardiac Patient. Physician representatives include the Medicine Department Chair, Medical Directors of the Heart Institute, the Cardiac Cath Lab, Cardiac Rehab, Cardiology, the Heart Station/Chest Pain Center, and the Heart and Vascular Unit. This committee communicates the status of the division of Cardiology to the health system and considers future plans and goals for operations and capital.

Interventional Cardiology Meeting

The Interventional Cardiology Meeting meets on a quarterly basis and is designed to support ongoing communication among the interventional cardiologists. This meeting provides a format for sharing Quality Performance Metrics, Process Improvement and Peer Review with and by the physicians. This forum has been created to evaluate and track individual practitioners' quality and outcomes. This forum has been implemented to provide a peer review process specific to PCI/interventional cardiology.

The Cardiac Operations Team

The Cardiac Operations Team is led by the Director for the Cath Lab and meets monthly to address internal processes that impact the requirements set forth by the Society of Cardiovascular Patient Care (SCPC) in response to the Chest Pain Accreditation. Members of this committee include staff and leadership from across the organization who have responsibility in the continuum of care for the cardiac patient.

The Cardiac Workgroup Committee

The Cardiac Workgroup Committee was established to focus on the requirements set forth by the State of Maryland to oversee the care of the STEMI patients. The Committee has evolved over time to include the npPCI patient population and includes members of the Research department. Topics of discussion within the Committee include operational overview, data, obstacles and updates related to the process improvement in the care of the interventional cardiac patient.

Wayfinding Committee

The Wayfinding Committee meets monthly and utilizes the criteria set forth in Cycle IV Chest Pain Accreditation to provide consistent and clear information to guide individuals to their destination. Wayfinding is increasingly being founded on evidence-based design principles much like the current treatment of the STEMI patient is supported with evidence-based medical practice. Members include representatives from the Capital Project management group, Public Relations, and Cardiology.

Heart and Vascular Unit Quality Committee

The Heart and Vascular Unit Quality Committee, led by the unit clinical director for nursing, has been instrumental in monitoring the following outcomes and continues to focus on improving care in the department:

- Intra-operative communication with family members
- Revised Respiratory tray in Code Box
- Decrease in patient Falls
- Decrease in Inpatient First case OR delays
- Increased Communication, Teamwork and process improvement with Huddles and Debriefs, which are imperative for patient safety
- Interdisciplinary Rounds
- Hand washing initiative
- Increased patient satisfaction

Observation Unit Quality

Led by unit charge nurse, this group issues Observation Unit Quality reports on the following Quality Indicators:

- 4PTS (patient safety line) trends
- NDNQI indicators
- Core Measures
- Unit Specific nurse regulatory praises
- Patient Satisfaction Survey Results
- Nursing Documentation and data

MIEMSS Regional STEMI QA

The MIEMSS Regional STEMI QA are regional meetings to review STEMI processes, procedures, and metrics. These meetings have been instrumental in enabling MIEMSS to create a standardized feedback template from all organizations that impacted the care of the STEMI patient in Maryland. AAMC has been involved in EMS Regions 3, 4, and 5, has representation on the Region 5 quality committee of MIEMSS, and works with the area EMS to support education and quality.

Resuscitation Committee

The Resuscitation Committee is run by the Critical Care team and meets monthly. The Committee discusses Code Blue and Rapid Response documentation and case reviews. The Committee also oversees Stroke rapid response calls, and therapeutic hypothermia protocol. This

team reviews data focused on the inpatient that develops chest pain. This group was instrumental in allowing the Rapid Response Team to be called for this patient population. The Rapid Response protocol has been updated to include Chest Pain. In doing this, awareness has been raised for the in-house STEMI patient.

The protocols required under this section are addressed in the following way:

- (i) **Establish protocols that govern the referral, admission, and discharge of cardiac surgery patients;**

Protocols for referral to the cardiac surgery program at AAMC will include access via several routes. These options for cardiac surgery patient referral will occur via four routes. All routes will be posted on the AAMC cardiac surgery website which will be developed for patient and physician education.

Direct referrals can be made in the following manner: (1) by contacting the cardiac surgery office directly at the cardiac surgery office number; (2) by calling the AAMC operator who will connect the referring physician to the on call surgeon; in the event that the surgeon is not immediately available, there will be a cardiac surgery PA/NP who will field such referrals; (3) by contacting specific cardiac surgeons directly via their personal numbers; (4) by directly consulting the NP/PA who will be in-house during the day and immediately available at night. This information will be available on the website and printed on laminated AAMC cardiac surgery information cards, which will be distributed widely to area physicians.

The website will include specific referring physician-level information. It will include the contact information for referrals as well as descriptions of the indications, alternatives, risks, and benefits of the most commonly performed cardiac surgery procedures such as coronary artery bypass grafting, valve replacement and repair, and the treatment of thoracic aortic diseases. In a separate identified section of the AAMC Cardiac Surgery website, information will be available for patients regarding the diseases treated, the medical and surgical treatment options, and the evaluation and treatment process, including what to expect at each step along the way from the initial evaluation of the treatment through the morning of discharge and follow up. This information will also be helpful to many healthcare providers and may aid in the referral process. The admission and discharge processes will be standardized for efficiency and patient safety. Standard admission order sets will be used for each of the major types of surgeries, general evaluations, and readmission. There will also be standardized order sets for the transfer of patients from the OR to the ICU and from the ICU to the step down unit. Examples are included with this application.

Patient safety will be optimized by two general processes: (1) the use of time out checklists and (2) the use of treatment protocols. Timeout checklists will be used prior to the commencement of operations. They will also be used prior to the transfer of patients from the Operating Room to the ICU to ensure that equipment like emergency pacemakers and defibrillators are charged and ready to use. There will also be a formal timeout checklist used to govern the ICU admission process. These protocols will ensure that information is provided in a standard and organized fashion, that medications and equipment are transferred appropriately and in working condition, and that the plan is established together by the surgeon and intensivists. Standard ICU order sets and protocols for the treatment of common clinical scenarios will be used. Examples of these checklists, order sets and treatment algorithms are included with this application (Exhibit 9(d)).

The discharge process will be standardized. This process will include the discharge teaching, communication to referring physicians and follow up appointments. All patients will leave the hospital with a discharge book containing care plans, medication, wound care, and activity instructions along with follow up information. An example is included with this application.

(c) Establish and review a list of indications and contraindications to govern selection of patients for cardiac surgery;

The cardiac surgery practice will be one of elective, urgent and emergent adult cardiac surgery. The procedures performed will include the broad range of adult cardiac surgery procedures widely used to treat the types of cardiac pathology seen commonly in the United States. These procedures will be primarily, but not limited to, coronary artery revascularization, valve repair and replacement, tumor resection, treatment of diseases of the aorta and great vessels and the treatment of traumatic injuries. All indications for operative procedures will be identified in a manner consistent with good clinical practice based upon AHA/ACC guidelines as well as the usual and customary practice employed at the JHM Division of Cardiac Surgery.

(d) Establish a program to educate patients about treatment options;

Patient education is a multidisciplinary proposition. Each patient will undoubtedly receive some condition-related information from their cardiologist about their diagnosis and what the treatment options are prior to referral. The portion of the patient education process under the control of the AAMC team will begin at the initial surgical consultation for elective patients and their family. The diagnosis will be explained in an understandable manner, and the diagnostic tests used to arrive at the diagnosis will be reviewed with the patient. All patients will have the opportunity to review the diagnostic tests with the consulting surgeon. The cardiac surgeon will describe the indications, alternatives, risks and expected benefits of the planned procedure. An STS PROM Score (Predicted Risk of Mortality) will be generated and discussed with each patient. Materials specific to the disease and its surgical and non-surgical treatment options will

be provided. This information will also be available on the AAMC Cardiac Surgery website. Patients and their family will meet with patient service coordinators who will do pre-operative teaching and discuss plans and expectations for post-operative care, discharge and follow up.

All patients will meet with a patient service coordinator during the discharge planning process to keep patients and their families informed. Patients will meet with a RN who will, along with the patient service coordinator, review their medications and perform post-operative teaching prior to discharge. Included in this teaching will be specific dietary recommendations and physical restrictions. Each patient will leave the hospital with a patient handbook which will contain the information presented to him/her in the discharge teaching as well as numbers to call for questions twenty four hours a day, seven days a week. This book will be a modification of the one currently in use at the JHH (Exhibit 9(d)).

Included in this book will be general cardiac surgery information and educational materials, as well as educational materials specific to the patient's condition, such as caring for a pacemaker, which is currently provided to patients at the JHH. AAMC's modification of these educational materials will also be available on the AAMC cardiac surgery website. Copies of this information and the link to this JHU information will be provided.

(iv) Establish mechanisms for monitoring long-term outcomes of discharged patients:

All patients will meet with a patient service coordinator and a RN during the discharge planning process. Included in this teaching will be specific dietary recommendations and physical restrictions. Patients will be educated about maintaining logs of their temperature, weight, blood pressure (if applicable) and pulse. Visiting Nurses will be scheduled to see the patients, when indicated, for monitoring of vital signs, assessment of wounds, medication compliance, and general wellbeing. All patients will leave the hospital with a copy of the AAMC Post Op Cardiac Surgery Care Handbook. This handbook will be a modification of the one currently in use at the JHH. It will be reviewed in detail during the discharge planning process. A copy is included with this submission as Exhibit 9(d).

All patients will receive an AAMC cardiac surgery patient wrist bracelet, which they will wear until released from follow-up care. These bracelets will contain routine and emergency program contact information to enable efficient and clear communication.

All patients will leave the hospital with appointments established for their follow-up appointments with their cardiologist, the AAMC cardiac surgeon, and for any laboratory or radiology studies required for their follow-up visits. Patient service coordinators will contact each patient by phone daily for the first three days, and weekly until the post-operative visit following discharge to assess progress and answer any questions.

AAMC's cardiac surgery program will participate in the Society of Thoracic Surgeons (STS) database, and all patients will be submitted. The program will have its own unique program identification. There will be a single individual responsible for the collection and submission of data hired by AAMC and JHU with protocols already in place at JHU. Quarterly and annual reports will be reviewed by the AAMC Cardiac Surgery Advisory Committee independently and in conjunction with the leadership of JHU on an annual basis.

AAMC's cardiac surgery program will also participate in the Maryland Cardiac Surgery Quality Initiative (MCSQI). This initiative is a collaborative statewide program begun independently in 2014 by the cardiac surgery programs in the State of Maryland. The goal of the program is to share data amongst all of the programs in the State to identify best practices and help all programs in the State of Maryland achieve the highest quality outcomes in a cost effective fashion.

(v) Review morbidity and mortality rates and other indicators of patient outcomes, and compliance with established processes of care as compared with regional or national averages;

Bi-weekly cardiac surgery Morbidity and Mortality (M&M) conferences will be held at AAMC to discuss cardiac surgery cases. The cardiac surgery program will participate in the larger Department of Surgery M&M program at AAMC. A separate monthly joint M&M conference will be held with the cardiac surgery program at JHU. A detailed Phase of Mortality analysis will be performed for all deaths.

AAMC will monitor its outcomes by participating in the STS National Database and the MCSQI, as described above.

A bi-weekly quality improvement program meeting will be held on alternate weeks from the M&M conference with AAMC clinicians. AAMC specific considerations will be addressed. In addition, joint QI projects will be coordinated with JHU to address larger issues in common with both JHU sites to review and establish joint protocols. Included with this application are recent and ongoing QI initiatives at JHU.

Additional topics to be discussed at the QI meetings will include review of costs to support cost-effective service delivery, patient flow to help promote patient satisfaction, and adequacy of patient and referring physician communications.

(4) Cost Effectiveness

An applicant proposing establishment or relocation of cardiac surgery services shall demonstrate that the benefits of its proposed cardiac surgery program to the health care system as a whole exceed the cost to the health care system.

- (a) An applicant that proposes new construction of one or more operating rooms, cardiac catheterization laboratories, or intensive care units, or any combination thereof, as necessary infrastructure for its proposed new cardiac surgery program shall document why existing resources at the applicant hospital cannot be used to accommodate the proposed cardiac surgery services.**
- (b) An applicant shall provide an analysis of how the cost of cardiac surgery services for cardiac surgery patients in its proposed service area and for the health care system will change as a result of the proposed cardiac surgery program, quantifying these changes to the extent possible.**
- (c) An applicant shall provide an analysis of how the establishment of its proposed cardiac surgery program will alter the effectiveness of cardiac surgery services for cardiac surgery patients in its proposed service area, quantifying the change in effectiveness to the extent possible. The analysis of service effectiveness shall include, but need not be limited to, the quality of care, care outcomes, and access to and availability of cardiac surgery services.**

APPLICANT RESPONSE

(a) Construction

The project does not involve new operating rooms, labs, or ICU construction. The project involves use of renovated space and the use of currently-planned expansions to relevant facilities.

(b) Lower Cost and (c) Improved Effectiveness

In the presentation of 10.24.17.05(2), Certificate of Need Standards for Cardiac Surgery Programs, Impact, Chart 10 delineated how AAMC's 337 projected cardiac surgery cases in FY 2018 would be drawn from cardiac surgery hospitals in Maryland and Washington, DC Chart 14 below documents the number of relocated cases by hospital, combining the 221 cases from WHC and the 5 cases from George Washington University Hospital into a single category (Washington, DC hospitals). The payment per case for the Washington, DC hospitals (\$58,681) blends the Medicare payment per case for WHC derived from the 2013 MedPAR data (\$44,080)

and the estimated non-Medicare payment per case derived from a national claims data source covering cardiac surgery rates in the Washington, DC and Arlington markets.

The payments for Maryland hospitals were set equal to their average allowable charges for the case mix of the AAMC cardiac surgery cases with the charges discounted by the estimated average payer differential of 4.4%.

The AAMC payment (\$35,851) equals the total projected charges per case of the cardiac surgery program discounted by 4.4% for the payer differential (\$37,501 x 95.6%).

Chart 14
The AAMC Cardiac Surgery Program
Reductions in the Costs of Cardiac Surgery Services
FY 2018

	AAMC Relocated Cases	Estimated Payment	Total Aggregate Payments
Johns Hopkins	69	\$65,174	\$4,497,006
UMMS	29	\$66,803	1,937,287
Union Memorial	2	\$46,963	\$93,926
UM St Joseph	1	\$36,958	\$36,958
Sinai	3	\$46,187	\$138,561
Washington Adv	6	\$45,034	\$270,204
DC Hospitals	227	\$58,681	\$13,320,587
Total/Average	337	\$60,221	\$20,294,529
AAMC	337	\$35,851	\$12,081,787
Savings			\$8,212,742

Chart 14 shows that the relocation of 337 cardiac surgery cases from Maryland and DC cardiac surgery hospitals to AAMC will reduce total aggregate hospital payments by slightly more than \$8.2 million for those services.

(5) Access

- (a) An applicant that seeks to justify establishment of cardiac surgery services, in whole or in part, based on inadequate access to cardiac surgery services in a health planning region shall:
- (i) Demonstrate that access barriers exist; and
 - (ii) Present a detailed plan for addressing such barriers.
- (b) Closure of an existing program, in and of itself, is not sufficient to demonstrate the need to establish a new or replacement cardiac surgery program.

APPLICANT RESPONSE

(a) Access Barriers¹³

The proposed program at AAMC will improve access for nearly 900,000 adults residing in Anne Arundel County and the surrounding region by providing (1) a local area hospital for cardiac surgery, improving continuity of care and minimizing transfers during acute episodes, (2) expanded access to JHH surgeons and clinical capabilities, and (3) a lower cost hospital alternative for cardiac surgery. Anne Arundel County is currently the only large county in Maryland that lacks a cardiac surgery program local to its region, resulting in access problems for residents of Anne Arundel County and residents of the nearby midshore counties (Talbot, Caroline, Kent, and Queen Anne's Counties). This proposal responds to the following imperatives:

(i) A Gap in Care in Anne Arundel County and the Eastern Shore

Growing population base –Nearly 10% of the State of Maryland's overall population resides in Anne Arundel County (approximately 550,000 residents), and this county accounts for more than 500 adult cardiac surgery cases. While this volume could support a robust cardiac surgery program, Anne Arundel County lacks a local cardiac surgery program. Instead, Anne Arundel County residents must travel to Baltimore City for the closest cardiac surgery program, and for some residents the average drive time to the closest cardiac surgery hospital is up to 40 minutes in normal traffic and even longer during heavy traffic. The absence of a program in Anne Arundel County has also impacted the broader geographic population base around Anne Arundel County: many residents of the midshore region (residents of Talbot, Queen Anne's, Caroline,

¹³ Part (b) of this standard, related to closure of an existent program, is not relevant to this application.

and Kent County) must now travel more than an hour to reach the closest cardiac surgery hospital.

Growing cardiac care program and care management at AAMC – AAMC has grown into one of the highest volume cardiac care programs and one of the busiest and highest volume CPORT programs in the State of Maryland. In CY2013, more than 150 patients with acute MIs were treated with emergency PCI procedures at AAMC. The cardiac catheterization labs at AAMC performed more than 240 elective PCI procedures and more than 1,000 cardiac catheterization procedures in 2014. The CPORT program has earned the highest marks in Maryland for quality, based on exemplary door-to-balloon time, excellent outcomes, and outstanding quality of care scores. AAMC's reputation for high quality cardiac care has been further recognized through its designation as a Cardiac Intervention Center by the Maryland Institute of Emergency Medical Services System and designation as a Chest Pain Center with PCI by the Society of Cardiovascular Patient Care. AAMC is also the recipient of the Gold Performance Achievement Award from the American College of Cardiology.

This clinically advanced, high volume, and high quality cardiac care program now serves a patient base that extends across eight counties in Maryland (including counties of the Eastern Shore and Washington Metropolitan region), and patient volume continues to grow. The program at AAMC offers the continuum of non-invasive cardiac diagnostics, cardiac catheterization, PCI, electrophysiology, surgical and non-surgical vascular procedures and cardiac disease management. However, the program is handicapped by the lack of an on-site cardiac surgery program. This situation results in disjointed cardiac care management for more than 200 patients per year, and is often accompanied by treatment delays. A cardiac surgery program is needed at AAMC to provide continuity of care to those patients with the severest forms of heart disease who are cardiac surgical candidates.

AAMC's accountability for the broader service area – Under its GBR agreement with the Health Services Cost Review Commission, AAMC is now accountable for a population base of approximately 1.1 million residents, a population that extends across eight different counties in Maryland. AAMC recognizes its responsibility and accountability to improve population health, enhance quality of care, improve health care outcomes, and lower the costs of care for this population. In this context, continuity of care and access to the full continuum of cardiac care services at AAMC has become even more critical. A cardiac surgery program at AAMC is necessary to provide access to a high quality, but lower cost option that is convenient to patients and is supportive of clinicians. It reinforces AAMC's commitment to quality outcomes, cost efficient service delivery, and effective care management.

(ii) Inadequate Access: The Evidence

Evidence from the CY2013-2014 period demonstrates that access problems exist for residents of the proposed service area, and recent studies indicate that care management and quality outcomes may be compromised as a result of longer travel times to a cardiac care service site. The evidence includes the following:

- **Delays in hospital-to-hospital transfers** – During FY 2014, clinicians at AAMC identified a total of 143 inpatients and 19 outpatients who required direct transfer for cardiac surgery, valve surgery, or immediate evaluation for surgery. All 162 of these patients required a hospital-to-hospital transfer. The choice of hospital was based on patient preference or physician recommendation but the need for the transfer was required due to the absence of cardiac surgery capabilities at AAMC. In this 12-month period, clinicians estimate that significant delays in care occurred for a number of these patients. These delays were largely associated with transfer to hospitals in Washington, DC. Delays were tied to (a) review/assessment/denials that were imposed by the receiving hospital for self-pay patients, (b) non-acceptance of patient's insurance plan, or (c) lack of an available bed at the receiving hospital. (See Exhibit 7(a) for Case Studies of Delays).
- **Travel time for midshore county residents** – In CY2013, more than 80% of cardiac surgery patients from Talbot, Kent, Queen Anne's, and Caroline Counties travelled an hour or more to either a Washington, DC hospital (37% of cases) or to a Baltimore City hospital (45%) for cardiac surgery. This travel time is burdensome to patients and their families and may carry higher risks for patients (see Footnote 14).

Chart 15
CY2013 ADULT CARDIAC SURGERY VOLUME
DISTRIBUTION OF CASES
Residents of 4 Midshore Counties

	Total Discharges	WHC	JHH	UMMC	PRMC	All Other Hospitals
Talbot County	60	10	2	35	13	-
Queen Anne’s County	55	27	12	14	-	2
Caroline County	36	5	3	16	10	2
Kent County	27	11	8	8	-	-
TOTAL	178	53	25	73	23	4

Sources:

- (1) HSCRC Discharge Abstracts, CY2013
- (2) DCHA Discharge Database, CY2013

- **Mortality rates and the episode of care** – While regulations indicate that “geographic access is not a problem” for cardiac surgery services, this assessment is based very narrowly on the distance to a hospital *for the single surgery admission itself*; it does not consider proximity to services for the entire *episode of care*. (See Section 10.24.01.08G(3)(b) – Need, “*Factors Defining Need for Cardiac Surgery at AAMC*”: travel time to surgical provider is the defining variable for access to care). However, patients whose disease requires cardiac surgery are at risk for acute episodes of ischemia, arrhythmia, or heart failure. Post-operative patients are at risk for complications that may require emergency surgical care. In all cases, the logical place to seek care – and at times, the best chance of survival – is with the hospital and team of physicians who are responsible for the surgical and medical management. Greater distance to this team means weaker access and higher risk to patients.

A recent study published in the Journal of Medical Care (2014)¹⁴ documents that longer travel time to the hospital for cardiac surgery and subsequent care may have significant effects on clinical outcomes. Researchers examined 10 years of clinical data from hospitals in Pennsylvania to analyze whether travel time—in non-emergency situations—affected clinical outcomes for coronary artery bypass graft surgery (CABG). These researchers documented a correlation between travel time and in-hospital mortality rates. For high risk patients, mortality rates were 2 to 5 times higher among those patients who travelled further for CABG surgery. The authors conclude that longer travel times were likely associated with psychological stress,

¹⁴ Chou, S et al. “Travel Distance and Health Outcomes for Scheduled Surgery,” *Medical Care* 52:3 (2014). (Exhibit 7(b)).

weaker family support, and less pre-operative preparation and education. While this study focused on in-hospital mortality rates, travel time is likely correlated with longer-term clinical outcomes, as well. Shorter travel time can better support steady post-operative care, compliance, and effective care management.

- **Post-Discharge Care**

In addition, all surgical procedures have incidence risk of post-discharge complications, some of which need to be treated emergently. When patients return home from a distant hospital and experience such a complication, they must either travel back to the hospital where their surgery was done, incurring potentially dangerous delay, or seek treatment at a closer hospital that may then need to transfer them yet again.

Clearly, “access” must be defined more broadly to include access for the entire *episode of care*; this would encompass pre-operative education, steady follow-up care, and care management, ideally at a single location. To date, many patients of the midshore region have had no other option but to travel nearly one hour’s time to the closest cardiac surgery provider. While patients have access to distant high quality providers for the surgery admission itself, access to comprehensive pre-operative procedures, urgent pre- and post-operative care, coordinated follow-up care and effective care management may be compromised as a result of that distance. A cardiac surgery program at AAMC will allow safe and rapid access to an integrated team of expert clinicians responsible for the entire care process and at a lower cost.

- **Underserved Communities**

The need for a program in Anne Arundel County has become even more pronounced over the past year. In contrast to declining volume in other regions of Maryland, case volume for Anne Arundel County residents has grown considerably. Between CY2012-2013, cardiac surgery volume in the overall Baltimore Upper Shore region grew by 6%, but Anne Arundel County’s population reported a 15% growth in cardiac surgery cases, one of the highest growth rates of all counties in Maryland. Thus, the county with one of the largest populations in the State, one of the highest rates of mortality from heart disease and the greatest growth in cardiac surgery volume in the Baltimore Upper Shore region remains without a cardiac surgery program that is accessible to its residents.

The disparities in health status in Anne Arundel County are of particular concern. In Anne Arundel County, the overall age-adjusted mortality rate related to heart disease

is 191.6 per 100,000 population; for African Americans, the mortality rate is far higher at 215.2 per 100,000 population. Disparities related to risk factors for heart disease are also significant, particularly for hypertension (high blood pressure) and diabetes. According to the American Heart Association, there is a strong correlation between heart disease and diabetes, with at least 65% of people with diabetes dying from some form of heart disease or stroke.

Nearly 68 percent of Anne Arundel County residents are overweight or obese, and 23 percent of adults smoke (33 percent of African Americans smoke). The rapid growth in the percentage of individuals with diabetes is alarming as well. The incidence rate for diagnosed diabetes for the county is 9.1 per 1,000 population¹⁵ which is slightly above the statewide rate of 8.9 per 1,000 population. In Anne Arundel County, the rate of Emergency Room visits for diabetes was 280.3 ER visits per 100,000 population, and for African Americans, the rate was 688.5 ER visits per 100,000 population; this compares with a statewide rate for African Americans of 593.3 ER visits per 100,000 population. The communities that AAMC serves present higher mortality and co-morbidity rates for heart disease and related problems.

In summary, the 1.1 million people served by AAMC are characterized by an increased population risk for heart disease and serious disparities in health status access for African Americans, a population significantly represented in AAMC’s proposed cardiac service area (as shown in the below chart). Moreover, the county population demonstrates a growing number of cardiac surgery cases. The absence of a cardiac surgery program at the most accessible hospital results in unnecessary risk for patients with heart disease.

Chart 16
AAMC Cardiac Surgery Service Area

Group	2013 Estimate		2014 Estimate		2018 Projection	
	Adult Population	% of Total	Adult Population	% of Total	Adult Population	% of Total
Black/African American	284,555	32.2%	292,246	32.6%	308,258	33.4%
Hispanic/Latino	54,315	6.1%	58,354	6.5%	67,354	7.3%
All Other	545,458	61.7%	546,324	60.9%	548,059	59.3%
Total	884,328	100.0%	897,253	100.0%	923,627	100.0%

¹⁵ <http://www.cdc.gov/diabetes/atlas/countydata/atlas.html> 2010 age-adjusted data adults 18+ yrs.

(iii) AAMC's Plan to Remove Access Barriers

The proposed cardiac surgery program at AAMC will improve access and further strengthen quality of care through the following:

#1 The new program at AAMC will assure more immediate access to care.

By avoiding the need to transfer patients from AAMC to another hospital, delays associated with hospital-to-hospital communications, bed availability, and transportation arrangements can be avoided, and unnecessary hospital days can be minimized. In addition, delays currently associated with reviews of insurance status at Washington, DC hospitals will be minimized: Under the All-Payer system in Maryland, AAMC will operate without the disincentive to serve the self-pay population.

#2 The new program at AAMC will broaden access to new treatment modalities and new clinical care protocols.

As a program partnership between JHM and AAMC, the new cardiac surgery program will provide residents of Anne Arundel County and the midshore counties with improved access to JHM surgical staff, new treatment modalities, and clinical care protocols. The new program will leverage the assets of the JHM cardiac surgery program by extending existing resources from its Baltimore location to the Anne Arundel County region.

#3 The new program at AAMC will integrate the continuum of cardiac care services for residents of this region, and strengthen care management under an integrated clinical team.

AAMC maintains a large community-based provider network and can provide nearby service sites for pre-operative and post-operative visits. AAMC's medical staff includes cardiologists in the defined service area, with office locations distributed in each county.

#4 The new program at AAMC will promote efforts to deploy specialists and improve local access to specialty services previously offered at only a limited number of service sites.

The success of the CPORT and CPORT-E program has proven that community hospitals can improve access to emergency and elective angioplasty procedures with minimal risk and positive outcomes. As a result of the CPORT and other expanded programs in cardiology, AAMC has established a base of excellent cardiologists, interventional cardiologists, and electrophysiologists. AAMC has demonstrated a track record of high quality outcomes for full care management of cardiac patients, with the exception of those patients requiring cardiac surgery who must be transferred outside of AAMC. The expansion of the cardiac program at AAMC to include cardiac surgery can be viewed as the natural extension of an advanced cardiac care program at a high quality community hospital. This expansion is endorsed by the cardiac surgeons at JHM who will partner with AAMC in the establishment of the program.

#5 The new program at AAMC will provide patients and payers with greater access to lower cost hospitals.

In CY2013, 36% of cardiac surgery patients from the defined service area were treated at the WHC for cardiac surgery, and another 45% of cardiac surgery patients from the service area utilized Maryland's two academic medical centers for cardiac surgery. The vast majority of cardiac surgery patients from this region, then, rely on hospitals where payment rates for cardiac surgery are 35-50% higher per case, on a case mix adjusted basis, relative to community hospitals in Maryland. In contrast, the cardiac surgery program at Anne Arundel Medical Center will be one of the lowest cost cardiac surgery providers in the region. The average payment per cardiac surgery case at Anne Arundel Medical Center's new program is projected to be nearly 40% lower than the average payment per case at the Washington Hospital Center (approximately \$23,000 lower per discharge on a case mix adjusted basis) and 45% lower than the average payment at the two academic medical centers in Maryland (approximately \$30,000 lower per discharge). Thus, the new program at AAMC is expected to produce significant savings to payers and offer lower cost options to patients who are likely to bear an increasing percentage of copayments going forward.

AAMC has a strong track record for serving as a high quality, low cost provider in Maryland. On average, AAMC reports a 28% lower inpatient charge per case relative to other Maryland hospitals, and its performance improvement initiatives continue to generate substantial cost savings and quality improvement. Its high market share for programs such as joint replacements (over 50% market share in Anne Arundel County and 40% market share across a five-county region) is a testament to both its high quality of care and affordability of care. AAMC expects patients and payers, alike, to recognize this same value at AAMC as a provider of cardiac surgery.

#6 The new program at AAMC will reduce travel time for more than 600,000 adult residents of the service area and enhance quality of care for both patients and their families. Most significantly, the new program at AAMC will reduce travel time by more than 20 minutes for more than 180,000 adults.

A detailed analysis and map depiction are provided at the end of this section to highlight the number of adult residents the AAMC program will affect by improving access. The implications are summarized below:

- Midshore residents
 - Currently, the closest location for midshore residents is 45-70 miles away, with a drive time of 55-95 minutes.
 - The AAMC program will reduce the drive time to a 35-65 minute drive for cardiac surgery.
- Anne Arundel County residents
 - Currently, the closest cardiac surgery provider for Anne Arundel County residents is 35-45 minutes away. The new program at AAMC will reduce this time by up to 20 minutes for some residents, and for those residents now travelling to Baltimore

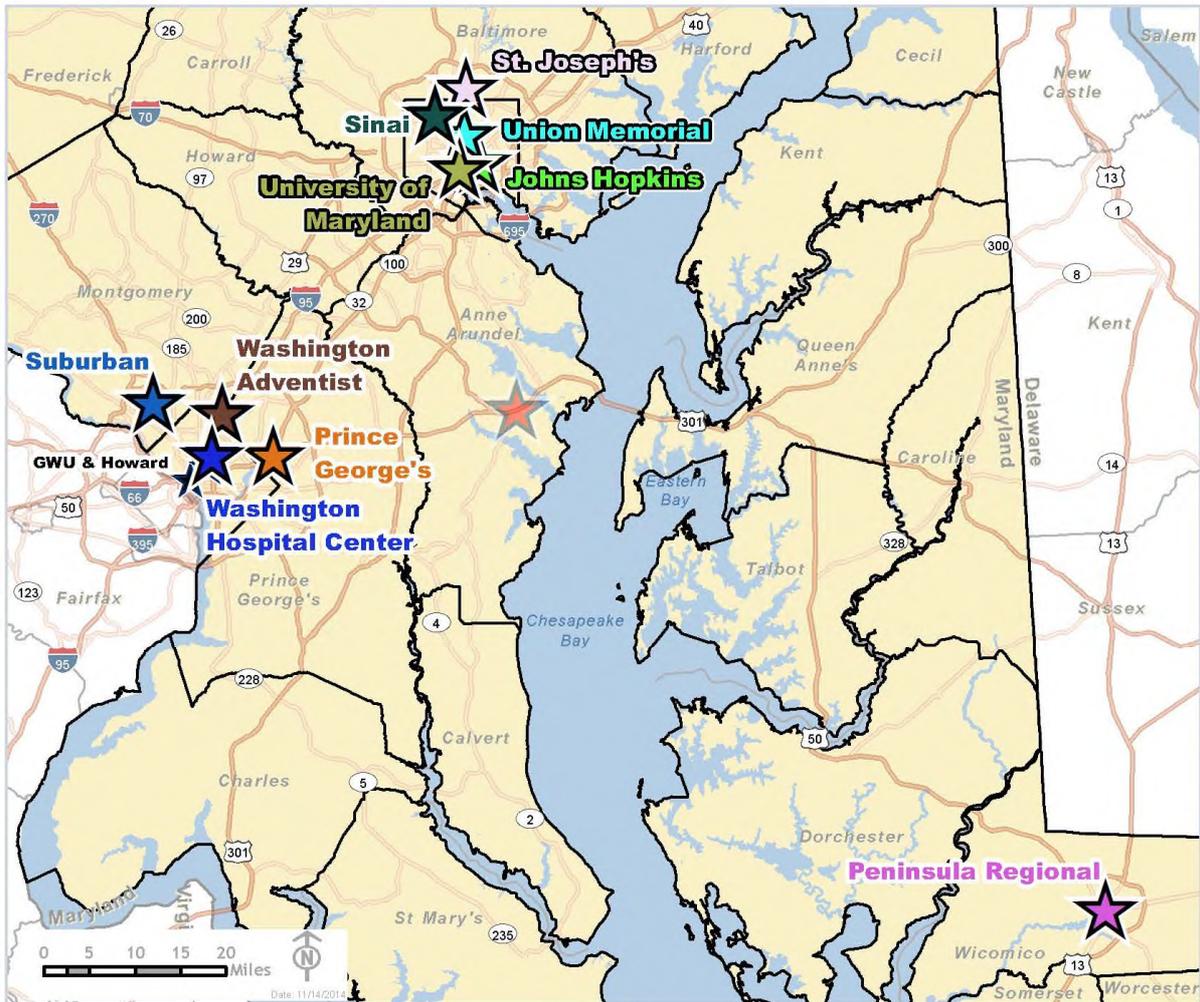
City and Washington, DC, the program at AAMC will reduce travel time by nearly one hour.

- The 7 county region
 - With the AAMC program in place, more than 180,000 adults will have their travel time reduced by more than 20 minutes.
 - Relative to the drive to Baltimore City and to the WHC, more than 700,000 adults will have their travel time reduced by more than 20 minutes.

These points are depicted in greater detail on the maps provided following this section.

Existing Cardiac Surgery Programs (adult)

Hospitals in Maryland and Washington, DC



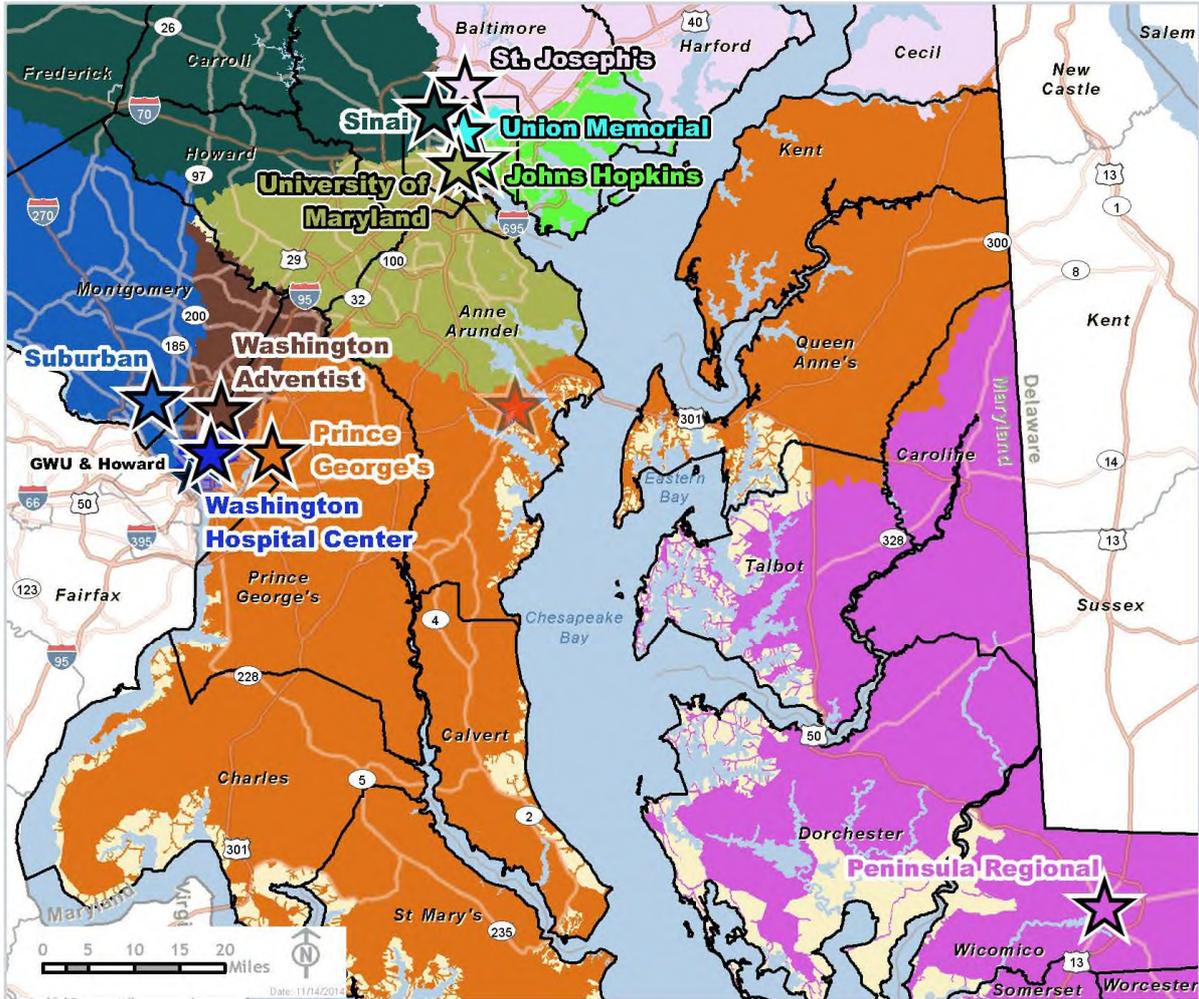
Currently, there are 11 hospitals in the State of Maryland and Washington DC with cardiac surgery programs that serve significant numbers of Maryland residents. The map shows them to be densely concentrated around Baltimore City and Washington, DC. Only two of these eleven hospitals are located outside the Baltimore or Washington Beltway: (1) Peninsula Regional Medical Center serves the southern portion of Maryland's Eastern Shore in Salisbury (2) Western Maryland Regional Medical Center (not in view) serves the City of Cumberland and the surrounding area.

A transparent red star represents the location of the proposed program at Anne Arundel Medical Center.



Current "Market Areas" (defined by drive time)

Maryland



This map shows the current "market area" for each cardiac surgery hospital in Maryland and Washington DC. A market area for a site is defined here as the area in which that hospital is determined to be the closest cardiac surgery program by drive time. The orange coverage represents the market area for Prince George's Hospital Center which, due to its location on the edge of the DC area, is determined to be the closest program to Southern Maryland, the Annapolis area, and the northern counties of the Eastern Shore. The University of Maryland Medical Center is the closest hospital to northern Anne Arundel County and most of the populated region of Howard County.

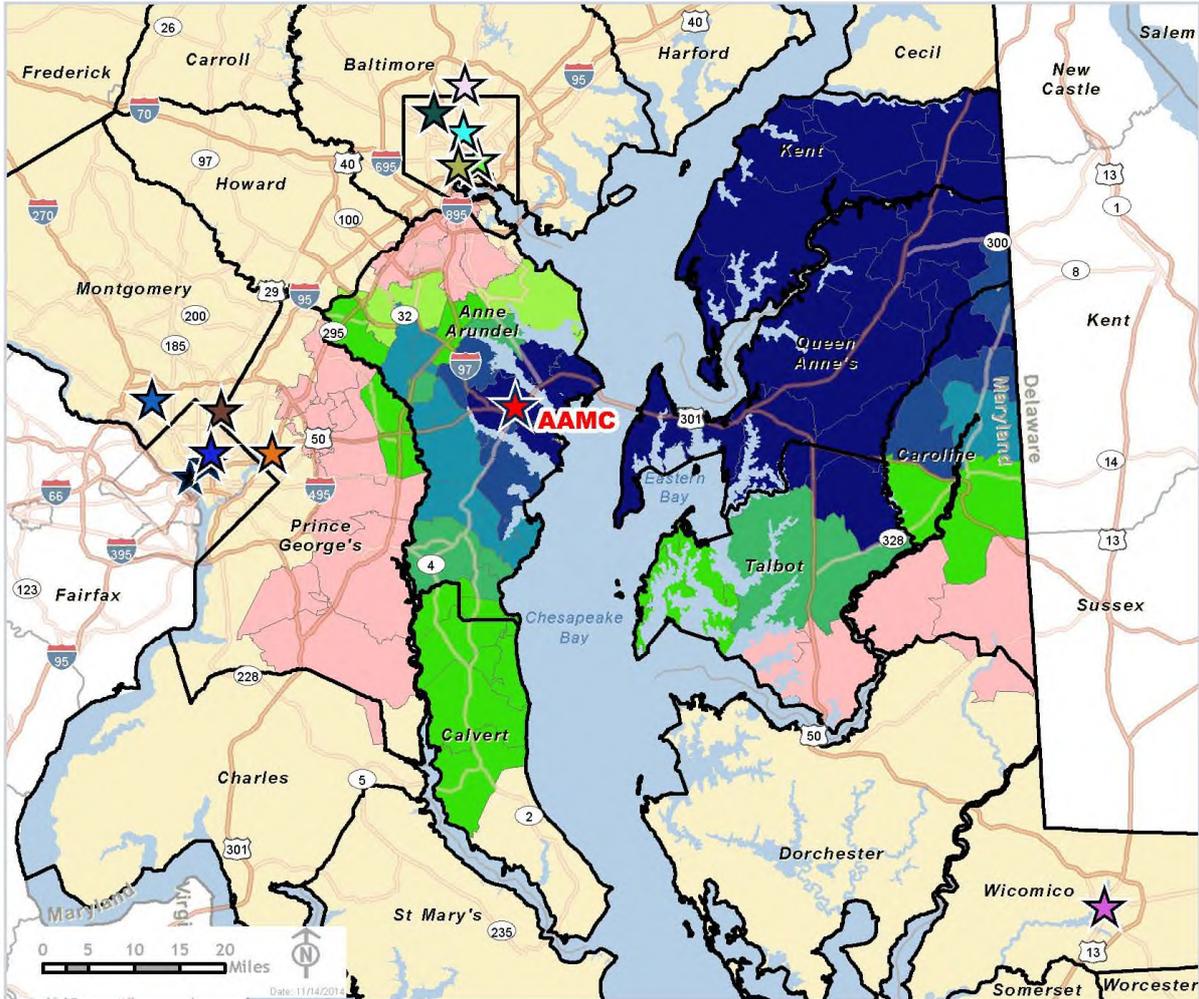
Notes: (a) These markets only take into account drive time. No other factors were involved in defining a market area (i.e. size of program, utilization of program). (b) The examination is limited to the boundaries of the State of Maryland and Washington DC. Only eleven programs were taken into account.

Current Market Areas (MD & DC)

- Johns Hopkins
- Peninsula Regional
- Prince George's
- Sinai
- St. Joseph's
- Suburban
- Union Memorial
- University of Maryland
- Washington Adventist
- Washington Hospital Center

Drive Time Improvement by Zip Code

Maryland



This map displays zip codes color-coded by drive time improvement that would be produced by the proposed program at Anne Arundel Medical Center. As shown in the table, more than 180,000 residents age 15 or older would see a drive time improvement of at least 20 minutes.

The greatest improvement across the service area would be approximately 25 minutes in reduction of drive time. This would be achieved for residents of Kent County, almost all of Queen Anne's County, the northern edge of Talbot County, and the Annapolis and Arnold areas of Anne Arundel County. A 20 minute improvement time would be produced for residents of northern Caroline County and areas in Anne Arundel County just west and south of AAMC. Drive time for Eastern Shore residents will be nearly identical due to the fact that the route to Prince George's or AAMC is the same once a driver reaches the Bay Bridge.

Population by Approximate Drive Time Improved with Proposed AAMC Program

Approx. Improved Time	Pop. Age 15+
20 minutes	58,299
25 minutes	122,881
30 minutes	1,113
Total Population:	182,293

Drive Time* Improvement w/ Proposed Program by Zip Code

25 minute improvement
20 minute improvement
15 minute improvement
10 minute improvement
5 minute improvement
minimal improvement
closer to existing program

*Drive Time: Calculated for peak traffic time over typical week

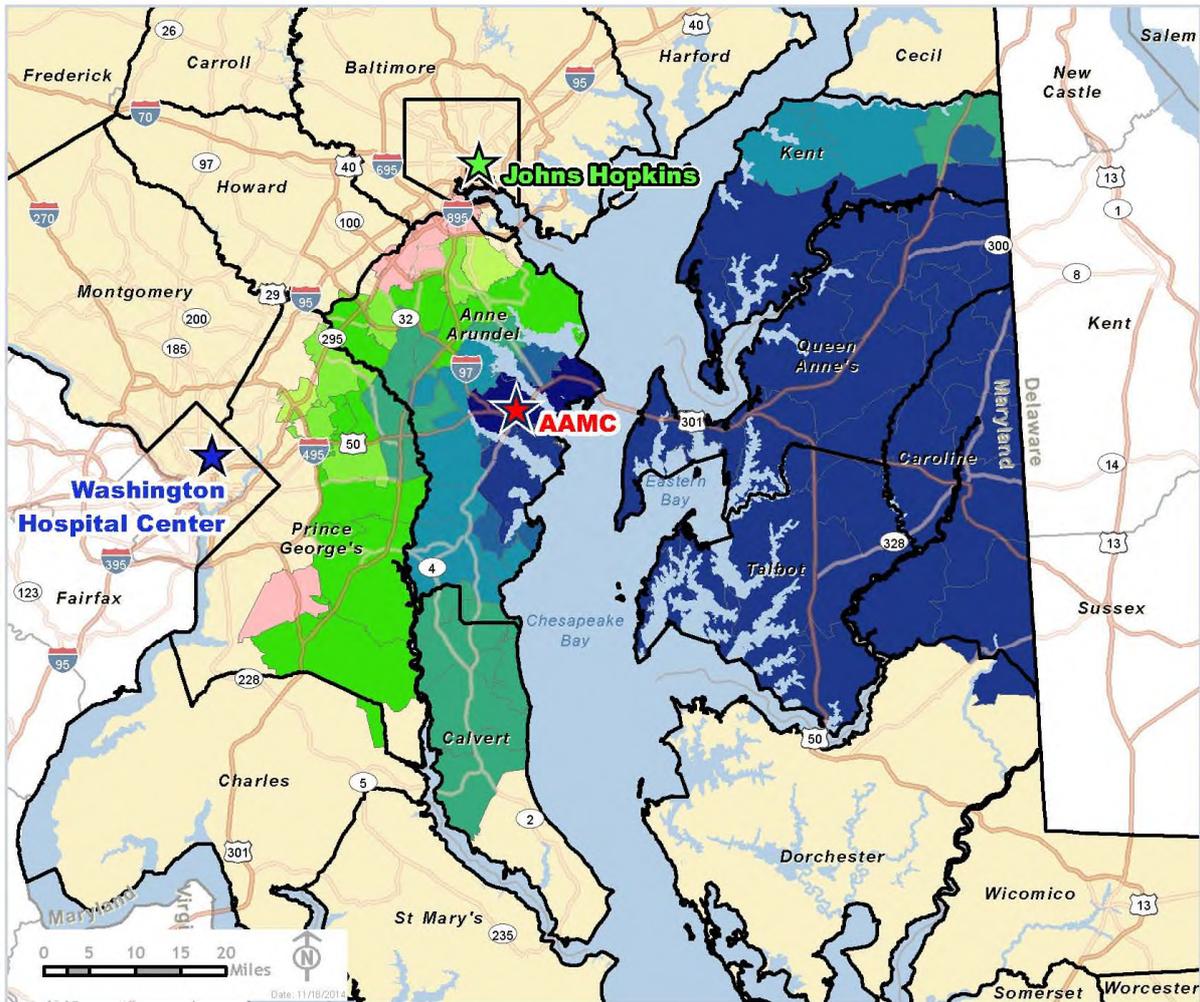


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Drive Time Improvement by Zip Code (WHC and JH)

Maryland



This map looks at drive time improvements with the addition of the program at AAMC when compared specifically to drive time to Washington Hospital Center and the Johns Hopkins Hospital. (No other existing facilities are taken into account).

As shown in the table, more than 340,000 adult residents in the service area live at least 20 minutes closer to Anne Arundel Medical Center relative to WHC or Johns Hopkins. The greatest drive time improvement would be experienced by residents of the Annapolis area and residents of the Eastern Shore.

Population by Approximate Drive Time Improved with Proposed AAMC Program (only compared to Washington Hospital Center and Johns Hopkins Hospital)

Approx. Improved Time	Pop. Age 15+
20 minutes	91,766
25 minutes	29,780
30 minutes	43,899
35 minutes	162,745
40 minutes	16,627
Total Population:	344,817

Drive Time* Improvement w/ Proposed Program by Zip Code in relation to WHC and JH

- 40 minute improvement
- 35 minute improvement
- 30 minute improvement
- 25 minute improvement
- 20 minute improvement
- 15 minute improvement
- 10 minute improvement
- 5 minute improvement
- minimal improvement
- closer to existing program



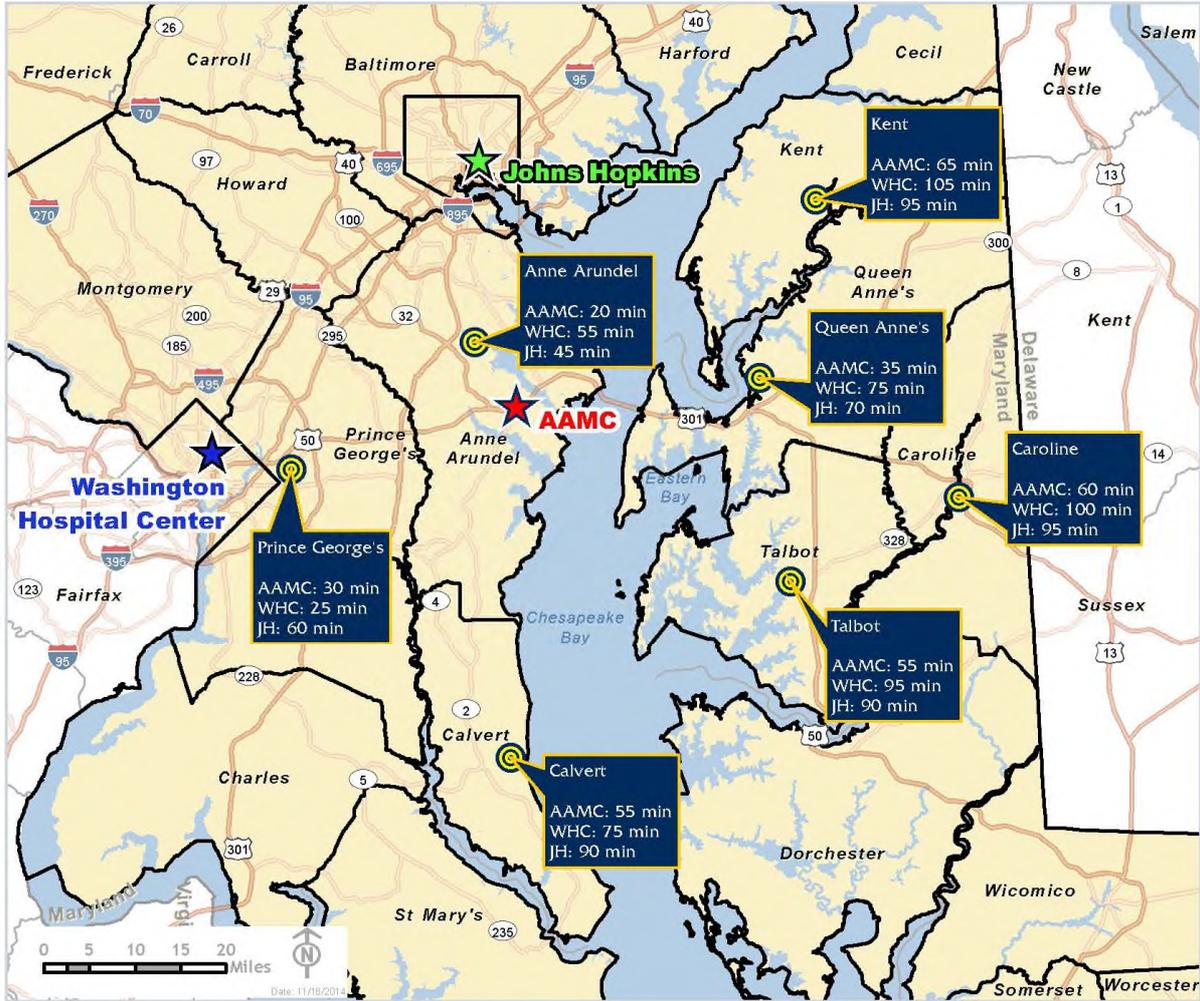
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*Drive Time: Calculated for peak traffic time over typical week

Drive Time Improvement by County (WHC and JH)

Maryland



This map displays the population center for each of the seven counties contained in the defined service area for Anne Arundel Medical Center. Each point is labeled with the approximate drive time* to three selected hospitals: Washington Hospital Center, Johns Hopkins Hospital, and Anne Arundel Medical Center.

The population in each county is closer to AAMC than to either of the other two sites, except for Prince George's County. The four Eastern Shore counties are approximately 35-40 minutes closer to AAMC relative to Washington Hospital Center or Johns Hopkins.

County Center of Population	Drive Time Improvement from AAMC to Next Closest Program	County Pop. Age 15+
Caroline	35 minutes	26,281
Queen Annes	35 minutes	40,616
Talbot	35 minutes	32,298
Kent	30 minutes	17,470
Anne Arundel	25 minutes	444,518
Calvert	20 minutes	72,969
Prince George's	WHC closer	703,558

County Center of Population



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*Drive Time: Calculated for peak traffic time over typical week

(6) Need

- (a) An applicant shall demonstrate that a new or relocated program can generate at least 200 cardiac surgery cases per year based on projected demand for cardiac surgery by the population in its proposed service area and an analysis of the market share that the applicant expects to capture for each zip code area in the proposed service area. An applicant shall demonstrate the reasonableness of the assumptions relied upon in defining its proposed service area.**
- (b) An applicant's need analysis for a new or relocated program shall account for the utilization trends in the most recent published utilization projections of cardiac surgery cases in Regulation .08 for:**
 - (i) The health planning region in which the applicant hospital is located; and**
 - (ii) Any other health planning regions from which it projects drawing, or from which available evidence indicates that it will draw, 20 percent of more of its patients.**
- (c) An applicant's need analysis for a new program shall include current information about the number of patients referred for cardiac surgery following a diagnostic cardiac catheterization at the applicant hospital and address how this information supports the applicant's demonstration that the proposed new program can generate at least 200 cardiac surgery cases per year.**
- (d) Closure of an existing program, in and of itself, is not sufficient to demonstrate the need to establish a new or replacement program.**

APPLICANT RESPONSE

(a) AAMC will serve more than 200 cases per year

The new cardiac surgery program at AAMC will serve well in excess of 200 cases per year based on population forecasts and projected use rates in the defined service area, and on evidence-based market share assumptions for AAMC. The sections which follow:

- Define and validate the cardiac surgery service area for AAMC;
- Profile the service area in terms of population and cardiac surgery use rates to project the total market for cardiac surgery;
- Establish AAMC's current market share position as the basis for establishing projected cardiac surgery market share; and
- Provide two (2) analyses that support projections for 200+ cardiac surgery cases beginning in Program Year 1 (FY2017).

i. Service Area Definition¹⁶

AAMC is located in Annapolis, Maryland and serves a population that extends across Anne Arundel County and communities in seven other counties, including Calvert, Prince George’s, Charles, Caroline, Talbot, Kent and Queen Anne’s counties. Discharge data demonstrates that AAMC serves as a major provider to these counties, particularly in the area of cardiac care. As an illustration, AAMC performs more than 20% of all adult PCI cases from the four midshore counties of Talbot, Caroline, Kent, and Queen Anne’s counties (CY2013).

The service area definition for the new cardiac surgery program represents the geographic area from which 90% of AAMC’s current base of PCI patients is now drawn. This service area was defined to serve those regions demonstrating one or more of the following factors associated with cardiac surgery:

- (a) Geographic access concerns
- (b) High rates of outmigration
- (c) Utilization of high cost hospitals, and/or
- (d) Proximity to AAMC and demonstrated utilization of AAMC, particularly PCI services

AAMC is strongly positioned—geographically, programmatically, and operationally— to serve this region’s population, produce quality improvements, and generate cost savings.

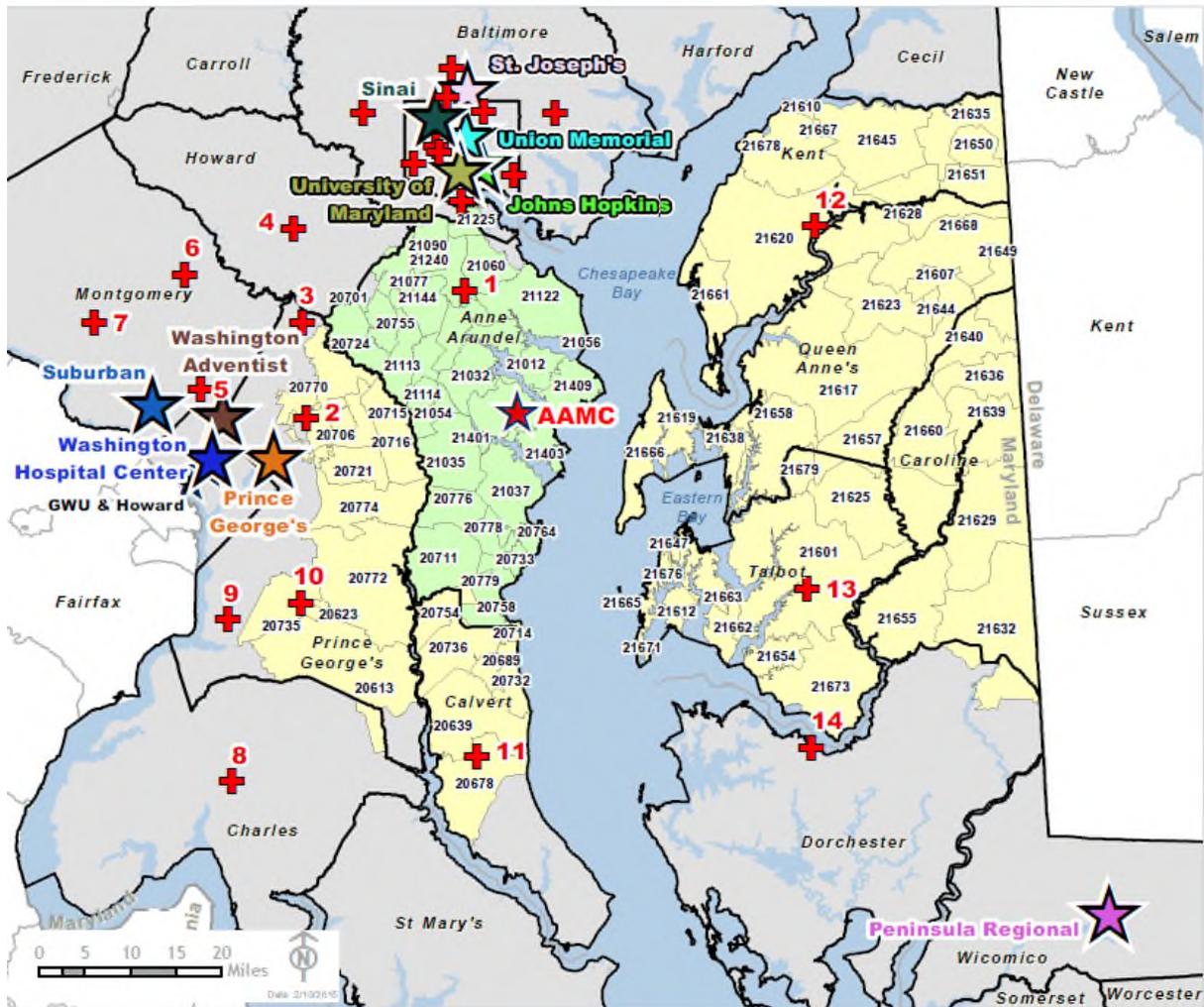
The proposed cardiac surgery service area for AAMC is defined as:

Baltimore Upper Shore	5 county subregion (Anne Arundel + 4 “Midshore” Counties)	Anne Arundel, Talbot, Kent, Queen Anne’s, and Caroline Counties
Washington Metropolitan	Contiguous communities assigned to AAMC (PG/Calvert communities assigned to AAMC)	23 zip codes in Prince George's and Calvert Counties Formally assigned to AAMC's service area under its GBR contract

The service area is depicted on the map which follows, and defined by patient origin statistics in the section following.

¹⁶ The service area defined here is distinct from the “GBR-defined service area.” The cardiac surgery service area is defined more broadly based on the criteria above and in response to region-specific needs for an additional cardiac surgery program.

Area Hospitals and Cardiac Surgery Providers



	All Maryland Acute Care Hospitals
	Cardiac Surgery Hospitals (adult)
ZIP Codes by Service Area	
	Primary
	Secondary

Acute Care Hospitals

Key	Hospital	Key	Hospital
1	BWMC	8	CIVISTA
2	Doctors	9	Ft Wash
3	Laurel Reg	10	So Md
4	Howard Co	11	Calvert Mem
5	Holy Cross	12	Chester River
6	Mont Gen	13	Easton Mem
7	Shady Grove	14	Dorch Gen

As noted above, the service area encompasses segments of both the Baltimore Upper Shore region (where AAMC is located) and the Washington Metropolitan region (which AAMC also serves). AAMC has defined each of these segments to be part of its service area based on the following evidence:

Baltimore Upper Shore: Anne Arundel and the Four Midshore Counties are a Distinct, Higher Need Market

The five-county subregion defined here accounts for approximately 80% of the medical cardiology and PCI volume at AAMC, and represents a distinct market within the much larger Baltimore Upper Shore region.

The Baltimore Upper Shore region, the largest of Maryland’s four planning regions, is comprised of 11 counties. Because this region is so broadly defined, the “metrics” that are tabulated across this wide geographic area often mask higher need in its subregions. The five county subregion in AAMC’s defined service area must be recognized as a distinct and higher need market, as reflected in the following indicators:

- The elderly comprise a significantly higher percentage of the population in this five county region, and the elderly cohort is projected to grow to 17% of the total population by CY2019. More notably, by CY2019, Talbot County and Kent County are projected to have two of the highest percentages of elderly in the State of Maryland (28% and 25%, respectively).

	Elderly (age 65+) as a % of total population	
	<u>Overall Baltimore Upper</u>	
	<u>Shore</u>	<u>5 County Sub-region</u>
CY2013, Estimated	11.7%	14.4%
CY2019, Projected	16.4%	17.1%

- The use rate for cardiac surgery in the midshore counties has declined far more slowly than in other counties in the Baltimore Upper Shore, reflecting a steadier demand for cardiac surgery.

	Average annual change in cardiac surgery use rate	
	<u>Overall Baltimore Upper Shore</u>	<u>5 County Sub-region</u>
CY2008-2013	-3.25%	-1.05%

- Population growth and the relatively modest use rate shift in the midshore are projected to result in relatively stable cardiac surgery volume for this segment of the Baltimore Upper Shore.

Adult cardiac surgery volume: # Discharges for Residents

	<u>Overall Baltimore Upper Shore</u>	<u>5 County Sub-region</u>
CY2013, Estimated	2,631	691
CY2018, Projected	2,313	669
% Change, 2013-2018	-12.1%	-3.2%

- The rate of outmigration from the midshore subregion to Washington, DC hospitals is notably higher than the overall outmigration rate from the Baltimore Upper Shore. With a redirection of volume to Maryland hospitals (anticipated under the new waiver), a significant increase in case volume may be projected for this region.

Outmigration from Baltimore Upper Shore region (CY2013)

	<u>Overall Baltimore Upper Shore</u>	<u>5 County Sub-region</u>
# Total adult cardiac surgery cases	2,631	691
# Cases at Washington Hospital Center	219	186
% Cases at Washington, DC Hospitals	8.3%	26.9%

- AAMC has built a base of affiliated physicians in this five-county sub-region of the Baltimore Upper Shore
 - At this time, there are 29 cardiologists on the medical staff of AAMC who practice in Anne Arundel County and 1 cardiologist on the medical staff of AAMC who practices in Kent and Queen Anne's Counties.

Washington Metropolitan: AAMC is accountable for a defined market within Prince George's and Calvert Counties

The Washington Metropolitan region (as defined by the MHCC) includes Washington, DC and six Maryland counties, including Prince George's County and Calvert County. Under its global budget revenue (GBR) contract, AAMC's defined service area includes 23 zip codes in these two counties, reflecting AAMC's major role as a provider to these communities:

- AAMC has built a strong base of affiliated physicians in this subregion of the Washington Metropolitan region
 - At this time, there are 2 cardiologists on the medical staff of AAMC who practice in this region. AAMC expects to make major investments in population health management in this geographic area, and AAMC is committed to provide local access to specialists.
- Residents of these communities account for approximately 15% of AAMC's medical cardiology discharges. Had a cardiac surgery program been available on-site at AAMC, it can be assumed that a large majority of these patients would have remained at AAMC for their cardiac surgical care, alongside their cardiologists.
- AAMC's outreach programs extend across this region and include hypertension awareness, screenings, and heart health programs for high risk individuals. AAMC's outreach programs are geographically broad-based and operate through partnerships with faith-based organizations, housing agencies, homeless shelters, and community centers. Many of these programs are targeted to minority and/or underserved communities.

Based on its historical market share and based on expectations of even more intensive outreach and case identification under its GBR contract, AAMC included these communities in the definition of the proposed service area for cardiac surgery.

AAMC's Service Area for Cardiac Surgery: Overall Profile

The five county segment of the Baltimore Upper Shore and the 23 zip code segment of the Washington Metropolitan region combine to define AAMC's service area for cardiac surgery.

Primary and secondary service areas

Consistent with conventional definitions, AAMC defined a primary service area and a secondary service area for cardiac surgery, adopting regional/county definitions where possible to align with the framework of health planning regions. The delineation of primary and secondary service areas was supported by patient origin statistics using the most relevant patient populations at AAMC: (a) PCI patients (b) medical cardiology patients, and (c) AAMC cardiac patients transferred to other hospitals for cardiac surgery. These patient populations provide a relevant and credible patient base upon which to project AAMC's future population base for cardiac surgery, and the analysis provides a consistent basis for defining AAMC's primary and secondary service areas:

Chart 17
PATIENT ORIGIN OF AAMC's REPRESENTATIVE PATIENT POPULATIONS
CY2013

	PCI	MEDICAL CARDIOLOGY	INPATIENT TRANSFERS FOR CARDIAC SURGERY	TOTAL ADULT DISCHARGES
PRIMARY SERVICE AREA				
Anne Arundel County	67.5%	68.2%	63.6%	64.5%
SECONDARY SERVICE AREA				
Midshore Counties: Talbot, Caroline, Kent, and Queen Anne's	12.6%	10.0%	14.5%	13.2%
Prince George's and Calvert Counties: GBR Segment	9.3%	15.0 %	14.5%	5.8%
Subtotal, Service Area	89.4%	93.3%	92.6%	90.5%
Subtotal, Out of Area	10.6%	6.7%	7.4%	9.5%
TOTAL AAMC	100.0%	100.0%	100.0%	100.0%

Source: HSCRC Discharge Abstracts

ii. The Market: Population, Use Rate, and Projected Case Volume

AAMC's service area, defined above, will generate enough cardiac surgery cases by 2018 (approximately 888 discharges, consistent with the MHCC's projected use rate decline) to support a cardiac surgery program at AAMC.

The defined service area represents a population of approximately 865,000 adults, projected to grow by approximately 1% per year. The elderly cohort in this region (age 65+ years old) is projected to grow and comprise 18% of the total population by CY 2018.

Using zip code-specific population projections from Nielsen SiteReports, and discharge data from the HSCRC and DCHA abstract databases, the historical trends in cardiac surgery case volume were documented for CY2008-2013, use rates were calculated, and the age cohort-specific projection formula prescribed by the MHCC was applied to project case volume for the defined service area (see "Methodology"). Use rate calculations for the Baltimore Upper Shore

counties and the Washington Metropolitan region segments were prepared separately, and total projected volumes for each region were summed to produce the total projected case volume for the defined service area.

As noted, the MHCC’s use rate projection formula—based on the average annual percentage change in use rates across the most recent 6-year period—was applied to the 2018 and 2019 projected population for purposes of sizing the future cardiac surgery market. The results were as follows:

Chart 18						
ADULT CARDIAC SURGERY (Age 15+ years)						
AAMC PROPOSED SERVICE AREA						
POPULATION-BASED PROJECTIONS						
Discharges per 100,000 population						
	<u>ACTUAL</u>					
	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Adult population	736,082	745,865	840,480	848,269	856,392	864,864
Adult cardiac surgery discharges	943	1,033	903	952	790	945
Discharges per 100,000 adult population	128.1	138.5	107.4	112.2	92.2	109.3
	<u>PROJECTED</u>					
	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
Adult population	872,006	879,467	887,262	895,406	903,917	912,810
Adult cardiac surgery discharges	930	917	905	896	888	883
Discharges per 100,000 adult population	106.6	104.2	102.0	100.1	98.3	96.7
Sources:						
(1) Population figures: Nielsen SiteReports						
(2) Discharges:						
(a) HSCRC Abstract Database, CY2008-2013						
(b) DCHA Database, CY2008-CY2013						
Notes:						
(a) Adults defined as age 15+						

AAMC would note, however, that clinicians at AAMC believe that the projected volume **understates the number of cases to be served** based on the following factors:

- The projection formula is based on the average annual growth rate across the 2008-2013 time period, a time period when cardiac surgery use rates declined considerably. Clinicians at JHH and AAMC do not expect a comparable decline in use rates going forward; in fact CY2013 experience already indicates a plateauing of use rates in this market. There is some indication that new technology and less invasive procedures will expand the candidate pool for cardiac surgery to include a higher percentage of elderly patients. This would result in an increase in use rates among the elderly population, not reflected in the MHCC's projection methodology.

iii. Utilization patterns and CY2013 market share, by hospital

The need for an additional cardiac surgery program is made evident by CY2013 utilization patterns. This data demonstrates two critical points:

First, patients endure long travel times. The majority of cardiac surgery patients from the defined service area travelled 35-95 minutes to receive their surgery with cardiac surgery providers in Baltimore City and Washington, DC. Only 27 patients from this region utilized Prince George's Hospital Center or Peninsula Regional Medical Center for cardiac surgery, possibly reflecting the relatively small program at these sites and/or patient preference for an academic medical center.

Second, patients are relying heavily on some of the costliest facilities. The vast majority of patients were treated at the three highest charge hospitals for cardiac surgery in the region: Nearly half of all cardiac surgery patients from the service area were treated at Maryland's two academic medical centers (45% of patients), and more than one third of all cardiac surgery patients from the service area were treated at the WHC (36%). The population base in this region, generating 945 adult cardiac surgery cases in CY2013, is large enough to support a locally-based, high volume program, and AAMC can provide a lower cost alternative.

Current utilization patterns are presented below based on CY2013 discharge data:

Chart 19

Adult Cardiac Surgery Market Share AAMC Cardiac Surgery Service Area Calendar Year 2013

Patient Origin	Johns Hopkins Hospital		University of Maryland Medical Center		Union Memorial Hospital		Sinai Hospital		St. Joseph Medical Center		Peninsula Regional Medical Center		Washington Adventist Hospital		Prince George's Hospital Center		Medstar Washington Hospital Center		All Other MD/DC Hospitals		TOTAL	
	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share	Cases	Market Share
Baltimore Upper Shore																						
Anne Arundel	113	22.0%	174	33.9%	67	13.1%	9	1.8%	11	2.1%	1	0.2%	3	0.6%	-	-	133	25.9%	2	0.4%	513	100.0%
Talbot	2	3.3%	35	58.3%	-	-	-	-	-	-	13	21.7%	-	-	-	-	10	16.7%	-	0.0%	60	100.0%
Queen Anne's	12	21.8%	14	25.5%	2	3.6%	-	-	-	-	-	-	-	-	-	-	27	49.1%	-	0.0%	55	100.0%
Caroline	3	8.3%	16	44.4%	1	3.6%	1	-	-	-	10	27.8%	-	-	-	-	5	13.9%	-	0.0%	36	100.0%
Kent	8	29.6%	8	29.6%	-	-	-	-	-	-	-	-	-	-	-	-	11	40.7%	-	0.0%	27	100.0%
Subtotal, 5 County Region	138	20.0%	247	35.7%	70	10.1%	10	1.4%	11	1.6%	24	3.5%	3	0.4%	-	0.0%	186	26.9%	2	0.3%	691	100.0%
Metropolitan Washington																						
Calvert, AAMC segment	6	10.9%	1	1.8%	-	-	-	-	-	-	-	-	7	12.7%	-	-	36	65.5%	5	0	55	100.0%
Prince George's, AAMC segment	19	9.5%	17	8.5%	1	0.5%	2	1.0%	-	-	-	-	36	18.1%	3	1.5%	117	58.8%	4	2.0%	199	100.0%
Subtotal, PG/Calv Segments	25	9.8%	18	7.1%	1	0.4%	2	0.8%	-	0.0%	-	0.0%	43	16.9%	3	1.2%	153	60.2%	9	3.5%	254	100.0%
Total, AAMC Card Surg Service Area	163	17.2%	265	28.0%	71	7.5%	12	1.3%	11	1.2%	24	2.5%	46	4.9%	3	0.3%	339	35.9%	11	1.2%	945	100.0%

Sources:

(a) HSCRC Abstract Database, CY2013

(b) DCHA Database, CY2013

iv. *AAMC Will Fill the Need*

1. AAMC currently has a strong market position in the service area with respect to inpatient cardiac care.

AAMC is a major provider of hospital services in the defined service area. In CY2013, AAMC treated 24% of all adult discharges (excluding cardiac surgery) and nearly 20% of all medical cardiology discharges from the defined service area. More notably, AAMC served 22% of all PCI cases *despite the competition and availability of the more “full service” cardiac surgery hospitals in the broader region.* This solid market share for cardiac care—even in the absence of a cardiac surgery program—speaks to AAMC’s clinical reputation for cardiac care and the strong provider relationships that AAMC maintains across the region. The sizable market share also reinforces the premise that AAMC’s existing referral relationships, its existing program reputation, and its existing patient base would very largely support success of a cardiac surgery program at AAMC.

Chart 20
AAMC Adult Market Share (CY2013)

	Adult Inpatient (*)	Adult Medical Cardiology	Adult Inpatient PCI
Anne Arundel County	32.5%	27.3%	30.0%
Four Midshore Counties	18.1%	12.2%	23.0%
Prince George's/Calvert segments	13.0%	9.0%	7.2%
Total, Defined Service Area	24.0%	18.9%	21.8%

(*) Excluding cardiac surgery and MDC 15
(Newborns and neonates)

2. AAMC Maintains Strong Clinician Relationships

AAMC has always maintained a strong base of affiliated cardiologists to serve its patient community, a physician base that includes both employed cardiologists and private, community-based cardiologists.

AAMC's cardiologist base is largely represented by the following six practices:

Chart 21
AAMC Cardiology Base

Cardiology Practice	Number of Physicians
AAMG Cardiology Specialists	5
Annapolis Cardiology Consultants, LLC.	4
Chesapeake Cardiac Care, P.A.	2
Bay Cardiology	1
Chestertown Cardiology	2
<u>Cardiology Associates</u>	<u>12 (*)</u>
Total	26 cardiologists

(*) Reflects the number of equivalent clinicians in full-time clinical practice

These six practices represent a total of 26 cardiologists, 4 of whom hold clinical leadership positions at AAMC. Each of these cardiology practice groups has expressed support for a cardiac surgery program at AAMC, and clinicians in each practice have indicated their desire to use the new program at AAMC. Clinicians have acknowledged the benefits of a local service site, the continuity of care it will afford, and the added value of the JHM affiliation. Expectations are that the majority of service area residents who had been served at the WHC and at the JHH will be served, instead, by the program at AAMC. This shift will result from a combination of patient preference, physician preference, and/or payer direction.

3. AAMC Has Extensive Outreach/Case Identification Initiatives

AAMC operates a broad-based outreach program of screenings, awareness and education programs, and self-management programs for high-risk individuals. Many of these programs operate in partnership with faith-based organizations, housing agencies, community centers, businesses, homeless shelters, and schools. Many of these programs are targeted to minority populations and/or underserved communities. Typically, these programs are designed also to link resident to primary care providers/specialists.

AAMC’s outreach programs include hypertension awareness, diabetes self-management programs, screenings, and heart health programs for high-risk individuals. Programs such as those in senior housings centers, businesses, and homeless shelters serve as case identification programs for heart disease, contributing to the growth of the cardiac program at AAMC. As these outreach program continue to expand under the population health model and GBR, AAMC expects its cardiac care program and patient base—particularly the high risk patient base—to grow even further.

These initiatives are discussed further below in the context of comparative review.

Projected Case Volume at AAMC: Two Supporting Analyses

AAMC projects that its new cardiac surgery program, to begin operation in FY 2017, will achieve the following performance levels in its first three years of operation:

**Chart 22
Adult Cardiac Surgery
Projected Case Volume**

	FY 2017 Projected Volume	FY 2018 Projected Volume	FY 2019 Projected Volume
Total Projected Adult Cardiac Surgery Volume	241	337	387
<i>(# discharges)</i>			
<i>In Area Volume</i>	223	312	356
<i>Out of Area Volume</i>	18	25	31
Total Market Size	896	888	883
AAMC Cardiac Surgery Market Share	25%	35%	40%

These projections are based on two separate analyses, each of which supports the assumption that AAMC can achieve a 40% market share by Year 3 of the new program and maintain a cardiac surgery program of nearly 400 cases by Year 3. The two supporting analyses are reviewed below.

Analysis #1: Practice-based referral estimates

AAMC clinicians conducted discussions with six local cardiology practices to estimate the number of referrals that could be expected from cardiology practices *currently referring to AAMC* for cardiac diagnostics and other specialty services. This analysis served to document the “base number” of cardiac surgery cases from existing referral sources, absent any further market share growth.

Analysis #2: Transfers/referrals of AAMC hospital patients + market share growth

AAMC clinicians reviewed all FY 2014 transfers and referrals from AAMC to document the total number of cardiac surgery cases generated by the hospital’s existing patient base (referred to as “existing volume” or “in-hospital demand” at AAMC). AAMC clinicians then estimated further volume shifts/referral redirection anticipated with the growth of the Johns Hopkins program partnership. The analysis supports final volume projections of well over 200 cases beginning in Year 1, and growth to 387 cases by Year 3 of the program. Based on the current distribution of AAMC transfers, the analysis also provided the basis for projected shifts of cardiac surgery cases by hospital and by payer.

Findings and conclusions from these analyses are summarized below.

Analysis #1 Base volume: Practice-based referral estimates

AAMC management conducted discussions with six local cardiology practices to document the number of cardiac surgery referrals made in the last year and to estimate the percentage of patients that clinicians expect to refer to AAMC as the new program begins operation and gains recognition. An adjustment factor was applied to the current referral volume to reflect the projected use rate, consistent with the projected use rate for the service area.

- The composite results from this survey demonstrated that AAMC can expect to serve more than 240 cardiac surgery cases from this existing referral base by the end of Program Year 1. This reflects the following factors:
 - Several of these practice groups represent high volume practices;
 - Many of these clinicians maintain an active presence, strong working relationships, and/or leadership roles at AAMC;
 - AAMC will become the preferred service site for clinicians to assure continuity of care and patient satisfaction ; and
 - Clinicians recognize the immediate value-added features that would be provided to patients by a program at AAMC: a more accessible location, continuity of care with

area cardiologists, lower costs of care, and the clinical expertise and new treatment modalities provided by the JHM surgical team.

**Chart 23
Base-Volume Referrals**

AAMC-affiliated Cardiology Practices	FY 2014 Referrals	Total Projected Practice Referrals ^[2]			AAMC Estimated Share			AAMC Projected Volume		
		FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019	FY 2017	FY 2018	FY 2019
AAMG Cardiology Specialists	105	101	98	98	90%	90%	90%	91	88	88
Annapolis Cardiology Consultants, LLC.	105	101	98	98	90%	90%	90%	91	88	88
Chesapeake Cardiac Care, P.A.	27	26	25	25	50%	75%	75%	13	19	19
Bay Cardiology	10	10	9	9	75%	90%	90%	7	7	7
Chestertown Cardiology	55	53	51	51	25%	50%	50%	13	26	26
Cardiology Associates ^[1]	120	115	112	112	50%	75%	75%	57	84	84
Total, 6 practices only	422	406	395	393	67%	79%	79%	272	312	312

[1] Estimated based on 12 cardiologists in full time clinical practice @ 10 referrals per physician per year

[2] Projections based on FY 2014 estimates adjusted for projected change in service area discharges

- Additional market share growth is anticipated based on expectations of further shifts from the JHH (as a function of program collaboration) and further shifts from the WHC (as a function of program recognition, patient preference, and payer direction). This broader analysis and set of final projections was prepared through Analysis #2 (see below).

Analysis #2: Total volume projection: AAMC hospital patients + market share growth

As one of the highest volume cardiac care providers in the state, AAMC is positioned to support a cardiac surgery program very largely through its existing patient base. This premise was tested and supported by an analysis that defined and quantified four patient cohorts expected to utilize AAMC's new cardiac surgery program,

Chart 24
Adult Cardiac Surgery Program
Projected Volume at Anne Arundel Medical Center
FY2014 Base and Projected Ramp Up
(use rate and ramp up applied)

Patient Cohort	Definition	Actual FY 2014	Assumptions	FY 2014 Estimated Achievable Volume	FY 2017 Projected Volume (Year 1)	FY 2018 Projected Volume (Year 2)	FY 2019 Projected Volume (Year 3)
Cohort (A)	EXISTING VOLUME AT AAMC – Currently transferred/ref'd	237	80% retention	188	179	178	177
Cohort (B)	SERVICE AREA PATIENTS NOW AT JHH	163	50% shift to AAMC (less direct transfers in Cohort A)	45	43	42	42
Cohort (C)	MARKET SHARE GROWTH/SHIFT	945 (total market)	Incremental Volume to Achieve Market Share: <ul style="list-style-type: none"> • Year 1: 25% • Year 2: 35% • Year 3: 40% 	158	17	108	155
Cohort (D)	OUT OF AREA		Additional 8% Incremental Volume	20	2	9	13
Total	Projected Adult Cardiac Surgery (A+B+C+D)				241	337	387

Projections for each patient cohort were based on the following evidence and set of assumptions:

Cohort A: Hospital patients at AAMC requiring cardiac surgery

Assumption: AAMC will serve 80% of all patients currently transferred or referred for cardiac surgery from AAMC

(A) (1) Transfers - In FY 2014, AAMC arranged direct transfer of 237 hospital patients for cardiac surgery, valve surgery, or immediate evaluation for surgery. Through individual case review, AAMC clinicians documented or estimated that a total of 162 of these

patients received surgery after transfer; this included 143 inpatients and 19 outpatients who were determined to have received cardiac surgery or valve surgery following transfer. Clinicians at AAMC estimate that at least 80% of these patients would have remained at AAMC if a cardiac surgery program had been available on site.

162 direct transfers x 80% = 128 surgical patients
--

(A) (2) *Referrals for surgery* - In FY 2014, cardiologists at AAMC referred 75 outpatients for cardiac surgery or valve surgery following outpatient diagnostic catheterization at AAMC. Clinicians estimate that approximately 80% of these patients would have received surgery at AAMC if a program had been offered on site.

75 outpatient referrals for surgery x 80% = 60 surgical patients
--

TOTAL COHORT A: EXISTING PATIENTS TREATED AT AAMC = 188 patients

("In hospital demand")

Cohort B: Volume shifts expected to occur from the JHH program collaboration

Assumption: 50% of all service area residents currently served at the Johns Hopkins Hospital will be served at Anne Arundel Medical Center

As discussed later in section 10.24.01.08G(3)(d), the program will operate under the leadership of the chief of cardiac surgery, who is a full time faculty member of the Johns Hopkins School of Medicine and will be a member of a team of three cardiac surgeons (2.5 FTEs). With the availability of JHM surgeons at AAMC, and with the AAMC-JHM program integration clearly communicated, clinicians expect that a minimum of 50% of service area residents currently treated at JHH for cardiac surgery will shift to the AAMC location:

- Patients from the defined service area are expected to prefer a hospital in closer proximity to home if AAMC can offer the same JHM surgical staff, state of the art technology, and excellent clinical caliber;
- Patients are expected to value AAMC's track record of high service quality; and
- Insurers are expected to value AAMC as the lower cost service site, and increasingly direct referrals to the lower cost service site with comparable value.

Based on this assumption, the following estimates were made:

CY2013, Total number of service area residents served at JHH = 163 patients

50% of current volume is projected to select/shift to AAMC = 82 patients

Less direct transfers/referrals already counted/documentated in Cohort A = (37 patients)

**TOTAL COHORT B: ADDITIONAL VOLUME PROJECTED TO SHIFT FROM JHH=
45 patients**

Cohort C: Further market share growth from other hospitals across the service area

AAMC expects to achieve 35% market share in its service area by end of Year 2 and 40% market share by end of Year 3. Most of this volume is accounted for by AAMC's existing patient base (Cohort A) and the planned volume shift from the JHH (Cohort B) defined above.

- Cohort A: Existing "in-hospital" demand at AAMC = 19% share
The current volume of AAMC's hospital patients transferred/referred for cardiac surgery translates into a **19% equivalent market share of cardiac surgery volume in the defined service area**. In other words, AAMC can expect to serve at least 19% of service area volume from its existing hospital patient base. This figure is prior to accounting for additional market share growth.
- Cohort B: Redirection from the JHH = Additional 4% share
Clinicians expect additional service area volume to shift from the JHH as a function of the collaborative program. The projected volume shift translates into an additional 4% market share.

AAMC projects further growth to achieve 35-40% market share in Program Years 2-3 based on the following:

- *Referral/redirection by large cardiology practices* – Clinicians from the six local cardiology practice groups affiliated with AAMC indicate that they expect to make the large majority of their referrals to AAMC; approximately 30-40 of these cases are now referred directly to JHH or WHC for both cardiac catheterization and surgery, and are not included in the transfer volume from AAMC (Cohort A). This volume would equate to an additional 3-4% market share.
- *Market share growth for chronic heart disease and PCI* –With the introduction of cardiac surgery, AAMC expects its cardiology market share to increase. Patients/clinicians who have not been comfortable using AAMC as an interventional cardiology provider in the

absence of cardiac surgery back-up will be expected to use AAMC more readily, and AAMC market share is forecasted to grow appreciably.

- *Overall market share growth in the midshore counties* – AAMC operates a community-based “hub” of physician practices in Kent County which is expected to continue building market share in the Eastern Shore region.

Based on AAMC’s strong starting point (an equivalent cardiac surgery market share of 19% from its current hospital patients) and the dynamics forecasted above, the new program at AAMC is expected to achieve a 40% market share for cardiac surgery by the end of its third year of operation.

**TOTAL COHORT C: FURTHER PROGRAM GROWTH TO
ATTAIN 35-40% MARKET SHARE IN SERVICE AREA
158 patients**

Cohort D: Out of area patients

The growth in service area volume is expected to be accompanied by growth in out-of-area volume, consistent with AAMC’s experience. Approximately 8% of AAMC’s PCI volume has been drawn from outside of the service area. Therefore, an additional 20 out of area patients are projected based on the assumption that 8% of total cardiac surgery patients will come from out of area

**TOTAL COHORT D: FURTHER GROWTH, OUT OF AREA VOLUME
MAINTAIN 8% OF TOTAL VOLUME FROM OUT OF AREA
20 patients**

Composite projection: Cohorts A + B + C + D

A composite projection, by patient cohort, is re-presented below based on the CY2013-14 “base analysis.”

- The base analysis simulates a current year program at full market share based on current market data and AAMC transfer volume. This volume is referred to below as “FY2014 Achievable Volume.”
- Based on these volumes, AAMC projected its FY 2017-2019 program volume by applying the projected change in use rates and ramp-up assumptions to achieve target market share by FY 2019. Therefore, program projections reflect the projected use rate

in FY 2017-2019, and a ramp up of AAMC's market share from 25% share to 40% share.

Chart 24 (repeated from above)
Adult Cardiac Surgery Program
Projected Volume at Anne Arundel Medical Center
FY2014 Base and Projected Ramp Up
(use rate and ramp up applied)

Patient Cohort	Definition	Actual FY 2014	Assumptions	FY 2014 Estimated Achievable Volume	FY 2017 Projected Volume (Year 1)	FY 2018 Projected Volume (Year 2)	FY 2019 Projected Volume (Year 3)
Cohort (A)	EXISTING VOLUME AT AAMC – Currently transferred/referred	237	80% retention	188	179	178	177
Cohort (B)	SERVICE AREA PATIENTS NOW AT JHH	163	50% shift to AAMC (less direct transfers in Cohort A)	45	43	42	42
Cohort (C)	MARKET SHARE GROWTH/SHIFT	945 <small>(total market)</small>	Incremental Volume to Achieve Market Share: <ul style="list-style-type: none"> • Year 1: 25% • Year 2: 35% • Year 3: 40% 	158	17	108	155
Cohort (D)	OUT OF AREA		Additional 8% Incremental Volume	20	2	9	13
Total	Projected Adult Cardiac Surgery (A+B+C+D)				241	337	387

A number of points are highlighted by this presentation:

- **AAMC's projections are supported by both a survey of its current referral base of cardiologists and an analysis of its hospital patient base (transfers and referrals for cardiac surgery).**

- **The 200 cardiac surgery volume target established in COMAR regulations can be achieved at AAMC very largely and very immediately by AAMC’s existing patient base, i.e., hospital patients who have been admitted / treated at AAMC, and are determined to require surgery.** The internal case review of FY 2014 AAMC patients demonstrated that AAMC’s existing patient base (served at the hospital) generates a case volume of 188 cardiac surgery cases (Cohort A).
- **AAMC can expect to maintain case volume that is well above the 200 minimum volume standard even in the context of projected use rates. The FY 2014 “simulated” model (total achievable volume, defined on the basis of FY 2014 volume) yielded 411 cases.** This volume was then “discounted” to reflect the projected use rate through CY2019. Based on the use rate methodology prescribed in COMAR regulations and AAMC’s growing market share, AAMC projects the following caseload:

FY2017, Year 1	241 discharges
FY2018, Year 2	337 discharges
FY2019, Year 3	387 discharges

Summary assessment

AAMC has demonstrated through multiple analyses that the 200 minimum volume standard for a cardiac surgery program can be exceeded at AAMC by the end of Program Year 1, and that more than half of this volume will be met by AAMC’s hospital patients. The availability of high quality, lower cost cardiac surgery at AAMC is expected to result in market share growth for the overall cardiac care program at AAMC, and the program partnership with its JHH partner is expected to further strengthen AAMC as a preferred cardiac surgery provider.

Reasonableness of market share projections

A close review of market share assumptions supports the reasonableness of AAMC’s projected market share for cardiac surgery. AAMC has projected 35% market share by Year 2 and 40% market share by Year 3 based on the following factors:

- Cardiac surgery demand from AAMC’s existing hospital patients - **AAMC currently demonstrates the equivalent of 19% market share for cardiac surgery based on the number of patient transfers and referrals from AAMC for cardiac surgery.** Therefore, AAMC can expect to achieve at least 19% market share through the hospital’s existing patient base.
- Program integration plans with JHM – The projected shift of service area residents now served at the JHH translates into an additional 4-5% market share.

- Individual cardiologists who now refer directly to the JHH – Based on survey information from the largest cardiology practices, an additional 30-40 cases are projected to shift from the WHC and JHH. This volume would translate into an additional 3% market share.
- Current market share for PCI – AAMC has already achieved nearly 22% market share for inpatient PCI services, and this market share is expected to increase as AAMC becomes a full-service provider; patients and clinicians are more likely to select AAMC as the provider of choice when cardiac surgery back-up is provided on site.

As a final test of reasonableness, AAMC examined its recent experience with new specialty programs to provide “benchmarks” for market share performance, providing further support to the reasonableness of a 25-40% market share target. This examination documented the following:

- Market share analysis for the overall adult market shows that AAMC currently captures 24% of total adult discharges in the defined service area (excluding cardiac surgery). Based on this documented experience, AAMC can expect to achieve a comparable market share relatively quickly for cardiac surgery and grow further to achieve 40% market share by the program’s third year of operation.
- AAMC has demonstrated a “track record” for achieving 30-40% market share for several other specialty programs. Market share for its joint replacement program and its bariatric surgery program provide illustrations. In CY2013, AAMC documented a 41% market share for joint replacement discharges in this very same broadly-defined service area for cardiac surgery and 32% market share for bariatric surgery:

Chart 25
AAMC Market Share

	AAMC Market Share Inpatient Joint <u>Replacement</u> CY2013	AAMC Market Share <u>Bariatric Surgery</u> CY2013
Anne Arundel County	50.1%	35.1%
Midshore Counties	27.1%	36.0%
PG/Calvert Segment	36.1%	24.3%
<i>PG Segment</i>	31.3%	22.0%
<u><i>Calvert Segment</i></u>	<u>54.1%</u>	<u>35.1%</u>
Service Area Total	40.7%	32.1%

Sources:

- (1) HSCRC Discharge Abstracts
- (2) DCHA Discharge Database

(c) AAMC’s volume of diagnostic cardiac catheterizations supports AAMC’s premise that the project will generate a caseload of greater than 200 cardiac surgery cases.

The existing need for a cardiac surgery program at AAMC is evidenced by the volume of cardiac catheterization procedures at AAMC and the expected number of patients requiring cardiac surgery subsequent to cardiac catheterization. The percentage of patients is consistent with national practice patterns and clinical expectations. These figures are documented below:

**Cardiac catheterization cases resulting in cardiac surgery
CY2014**

(Includes inpatient and outpatient procedures)

Percentage of diagnostic catheterizations resulting in cardiac surgery	11.4%
Total number of diagnostic catheterization procedures, CY2014 (12 months)	1,052 cases
AAMC rate of catheterizations resulting in cardiac surgery (last 7 months)	11.4%
Estimated annual number of diagnostic catheterizations resulting in cardiac surgery	120 cases

Based on the experience documented above, AAMC’s existing patient base of diagnostic catheterization patients, by itself, will account for nearly half of the projected volume in Program Year 1.

Summary statement

AAMC has demonstrated that its new program will:

- **Meet the need for a program that is geographically closer and more affordable to service area residents;**
- **Exceed the minimum volume standard of 200 cases, even as total case volume in the Baltimore Upper Shore and Washington Metropolitan regions are projected to decline; and**
- **Redistribute volume across existing providers without resulting in any one provider with 200+ cases to be reduced to <200 cases.**

Chart 26
Adult cardiac surgery
Projected case volume and market share

	<i>FY 2014 Estimated Volume</i>	FY 2017 Projected Volume	FY 2018 Projected Volume	FY 2019 Projected Volume
	<i>Existing ("In- House")</i>			
Total Projected Adult Cardiac Surgery Volume	<i>188</i>	241	337	387
<i>In Area Volume</i>	<i>188</i>	223	312	356
<i>Out of Area Volume</i>		18	25	31
Total Market Size	<i>945</i>	896	888	883
AAMC Cardiac Surgery Market Share	<i>20%</i>	25%	35%	40%

(b) An applicant’s need analysis for a new or relocated program shall account for the utilization trends in the most recent published utilization projections of cardiac surgery cases in Regulation .08 for:

(i) The health planning region in which the applicant hospital is located; and

(ii) Any other health planning regions from which it projects drawing, or from which available evidence indicates that it will draw, 20 percent of more of its patients.

AAMC expects to draw nearly 100% of its volume from two health planning regions, including (1) the Baltimore Upper Shore Region and (2) the Washington Metropolitan Region. Based on the most recently published utilization figures in the Maryland Register, the total number of projected cardiac surgery discharges for each of these regions will allow for AAMC to achieve its projected case volume (Year 2018 = 337 discharges) without causing volume at any one of the existing cardiac surgery providers now serving 200+ cases to decline below 200 discharges.

Analysis A: Impact of the addition of a new cardiac surgery provider

The recently published projections for cardiac surgery validate that the projected volume will support the addition of another cardiac surgery program in the region without resulting in any existing provider of 200+ cardiac surgery cases to decline below this minimum volume standard. This fact is presented by the analysis below, which applies current hospital market share to the

projected cardiac surgery volume for Year 2018 and shows the impact of AAMC’s new program in context of this projected market.

The recently published utilization figures are based on Year 2013 data and project a total of 2,704 cardiac surgery discharges for Baltimore Upper Shore hospitals and 1,971 discharges for Washington Metropolitan hospitals in Year 2018. This volume represents the total volume of cardiac surgery discharges projected to be served at hospitals within each Region. Therefore, the total discharges reflect outmigration of residents to hospitals outside of the local area, and reflect in-migration of out-of-area patients to hospitals in the region.

The projections by health planning region are documented below:

Chart 27
Projected Adult Cardiac Surgery Case Volume by Health Planning Region, CY 2014-19

Region	Year					
	2014	2015	2016	2017	2018	2019
Baltimore Upper Shore	3,007	2,935	2,853	2,777	2,704	2,635
Lower Shore	416	408	401	394	388	383
Washington Metropolitan	2,104	2,076	2,039	2,004	1,971	1,940
Western	153	143	134	126	119	112
Total, All Regions	5,680	5,562	5,427	5,301	5,182	5,070

Based on the projected volume for 2018, and based on the projected shifts across hospitals with the new program at AAMC, the following assessment is presented to demonstrate consistency with COMAR 10.24.17.08 (“Accounting for projections in published utilization projections”):

BALTIMORE UPPER SHORE REGION

Premise 1:

Total projected adult cardiac surgery discharges for CY2018 (State projection) = 2,704

Premise 2:

For FY 2018 modeling purposes in this assessment, we apply the total number of FY 2018 discharges projected by the State of Maryland for Baltimore Upper Shore hospitals, and assume that the distribution of discharges across Baltimore Upper Shore hospitals in CY2018 remains consistent with the distribution of discharges across Baltimore Upper Shore hospital in CY2013.

Chart 28
Baltimore Upper Shore Discharge and Volume Projections

	CY2013 Actual discharge distribution	Year 2018 Projected volume based on Year 2013 share
<u>TOTAL BALTIMORE UPPER SHORE HOSPITALS</u>	3,082	2,704
	CY2013 <u>Actual share</u>	Year 2018 <u>Projected volume</u>
Distribution by Baltimore Upper Shore hospital	(N = 3,082)	(N = 2,704)
Johns Hopkins Hospital	34.4%	930
University of MD Medical Center	26.3%	711
Sinai Hospital	11.1%	300
MedStar Union Memorial	18.6%	503
<u>Univ of MD St Joseph</u>	<u>9.6%</u>	<u>259</u>
TOTAL, UPPER SHORE HOSPITALS PROJECTION	100.0%	2,704

Premise 3:

A total of 104 discharges are projected to shift from Baltimore Upper Shore hospitals to AAMC in the Year 2018 and will not result in any existing provider with 200+ cardiac surgery cases to decline below 200 discharges.

Chart 29
Baltimore Upper Shore Market Share and Volume Projections

<u>PROJECTED TOTAL BALTIMORE UPPER SHORE HOSPITALS</u>			2,528	
	CY2013 <u>Actual share</u>	Year 2018 <u>Projected volume</u>	Year 2018 <u>Projected shift</u>	<u>Net Effect</u>
Johns Hopkins Hospital	34.4%	930	(69)	801
University of MD Medical Center	26.3%	711	(29)	636
Anne Arundel Medical Center	-----	-----	104	104 (*)
Other Upper Shore hospitals	<u>39.3%</u>	1,063	<u>(6)</u>	<u>987</u>
TOTAL, UPPER SHORE HOSPITALS	100.0%	2,704	0	2,704

(*) Note: Anne Arundel Medical Center will be drawing an additional 233 discharges from the Washington Metropolitan Health Planning Region

WASHINGTON METROPOLITAN HEALTH PLANNING REGION

Premise 1:

Total projected adult cardiac surgery discharges for CY2018 (State projection) = 1,971

Premise 2:

For FY 2018 modeling purposes in this assessment, we apply the total number of FY 2018 discharges projected by the State of Maryland for Baltimore Upper Shore hospitals, and assume that the distribution of discharges across Washington Metropolitan region hospitals in CY2018 remains consistent with the distribution of discharges across Washington Metropolitan region hospital in CY2013.

Chart 30
Washington Metro Discharge and Volume Projections

	CY2013 Actual discharge distribution	Year 2018 Projected volume based on Year 2013 share
<u>TOTAL, WASHINGTON METROPOLITAN HOSPITALS</u>	2,113	1,971
Distribution by Washington Metropolitan hospitals	CY2013 <u>Actual share</u> (N = 2,113)	Year 2018 <u>Projected volume</u> (N = 1,971)
Washington Hospital Center	68.5 %	1,350
Washington Adventist	15.2%	300
Suburban Hospital	9.5 %	187
George Washington University	4.5%	89
Prince George's Hospital Center	0.3%	6
<u>All Other DC hospitals</u>	<u>2.0%</u>	<u>39</u>
Total, Washington Metropolitan hospitals	100.0%	1,971

Premise 3:

A total of 233 discharges are projected to shift from Washington Metropolitan hospitals to AAMC in the Year 2018 and will not result in any existing provider starting with 200+ cardiac surgery cases to decline below 200 discharges.

Chart 31
Washington Metro Market Share and Volume Projections

	CY2013 <u>Actual share</u>	Year 2018 <u>Projected volume</u>	Year 2018 <u>Projected shift</u>	<u>Net Effect</u>
<u>PROJECTED TOTAL WASHINGTON METRO HOSPITALS</u>		1,971		
Washington Hospital Center	68.5%	1,350	(221)	1,129
Anne Arundel Medical Center	-----	-----	233	233 (*)
Washington Adventist	15.2%	300	(6)	294
Suburban Hospital	9.5%	187		187
George Washington Univ	4.5%	89	(6)	83
Prince George's Hospital	0.3%	6		6
<u>All other</u>	<u>2.0%</u>	<u>39</u>		<u>39</u>
TOTAL, WASH METRO HOSPITALS	100.0%	1,971	0	1,971

(*) Note: Anne Arundel Medical Center will be drawing an additional 104 discharges from the Baltimore Upper Shore Planning Region

Conclusion: The total number of projected cardiac surgery discharges for each of these two Health Planning Regions will allow for Anne Arundel Medical Center to achieve its projected case volume (Year 2018 = 337 discharges) without causing the volume at any one of the existing cardiac surgery providers now serving 200+ cases to decline below 200 discharges.

Analysis B: Population-based projections for AAMC’s new program and consistency with State of Maryland use rate formula

AAMC defined a service area that incorporates five counties from within the Baltimore Upper Shore region and segments from two counties of the Washington Metropolitan region. AAMC then adopted a population-based projection model *specific to this zip code-defined service area* to project total case volume for this service area (“market size”):

AAMC projected the total number of cardiac surgery cases for this defined service area based on the 6-year historical use rates for this defined service area:

- Use rates, by age cohort, were calculated for each region for years 2008-2013.
- The average annual change in use rates, by age cohort, was calculated and applied to projected population to project total cardiac surgery case volume for this defined service area.
- AAMC market share assumptions were applied to reflect the impact of competitors and to reflect outmigration that must be expected for this defined service area. (See Technical Notes.)

Outlined below are a number of points that demonstrates the consistency with the methodology underlying published projections:

- Data sources
 - Both the published regulations and the AAMC analysis were based on an integrated dataset for Maryland hospitals (HSCRC Discharges Abstracts) and Washington, DC hospitals (DCHA discharge database). Both the published regulations and the AAMC analysis were based on adult discharges only (age 15+ years).
- Use rate for service area
 - As noted, the AAMC analysis applied the prescribed age cohort-specific use rate formula to the zip code-defined service area based on the 6-year average annual change in use rates (CY2008-2013) for this service area (five counties in the Baltimore Upper Shore and segments of Prince George’s County and Calvert

County). This prescribed formula was used to project total case volume (“market size”) for the defined service area in CY2014-2019.

- The projected use rate for this service area was less steep a decline relative to the overall Baltimore Upper Shore, reflecting the population growth rate and higher percentage of elderly residents.
- Market share assumptions for AAMC
 - AAMC applied 25-40% target market share for the service area and applied these assumptions to the total projected market of cardiac surgery discharges for each projection year. Market share assumptions reflect competitor activity and account for “outmigration.”
 - AAMC projected that 8% of total cardiac surgery discharges would be accounted for by “in-migration,” *i.e.*, patients residing outside of the defined service area. This was based on patient origin of AAMC’s patient base for PCI and patient origin of its overall patient base.

Analysis C: Proposal for alternative methodology

The State of Maryland has published utilization projections for cardiac surgery based on a use rate projection calculated as the 6 year historical average annual percentage change in use rates. Clearly, an average change in use rate across a 6 year period will not reflect the most current technologies or the most recent clinical outcomes data that affect the criteria for surgery and size of the patient population. While the 6 year average change in use rates may help to “smooth out” anomalies of a single year, it does not represent the best measure for projecting use rates going forward.

Based on this premise, AAMC submits an alternative formula for projecting utilization based on a 3 year average annual percentage change in use rates. This change produces an entirely different forecast for case volume. To highlight this point, the projected use rate for the Baltimore Upper Shore Region’s *population* and for the Washington Metropolitan Region’s *population* is computed below based on a 3 year average annual change in use rate and based on a 6 year average annual change in use rate. (Note: AAMC acknowledges that the population use rate is just one component of the MHCC’s methodology for projected facility volume).

- For the Baltimore Upper Shore Region’s population, the differential in CY2018 and CY2019 projected case volume using these two different methodologies is more than 500 discharges.
- For the Washington Metropolitan Region’s population, the differential in CY2018 and CY2019 projected case volume using these two different methodologies is more than 300 discharges.

Chart 32

ADULT CARDIAC SURGERY DISCHARGES						
COMPARISON OF USE RATE-BASED PROJECTIONS						
BALTIMORE UPPER SHORE REGION						
(Region defined by patient residence)						
	<u>ACTUAL</u>					
	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Adult population	2,321,518	2,338,886	2,354,583	2,371,840	2,389,609	2,407,907
Adult cardiac surgery discharges	3,039	3,175	2,700	2,562	2,473	2,631
Discharges per 100,000 population	130.9	135.7	114.7	108.0	103.5	109.3
3 year average annual change in use rate						0.5%
6 year average annual change in use rate						-3.2%
	<u>PROJECTED</u>					
	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
Projected discharges @ 3 year average annual change in use rate	2,675	2,722	2,759	2,798	2,839	2,883
Projected discharges @ 6 year average annual change in use rate	2,569	2,509	2,441	2,375	2,313	2,253
<i>Difference: Number of discharges</i>	<i>106</i>	<i>213</i>	<i>318</i>	<i>423</i>	<i>526</i>	<i>630</i>

Sources:

(1) Population: Nielsen SiteReports

(2) Discharges:

(a) HSCRC Abstract Database, CY2008-2013

(b) DCHA Database, CY2008-CY2013

Notes:

(1) Adults defined as age 15+ years

(2) Use rates/use rate changes reflects age cohort-specific calculations

Chart 33

ADULT CARDIAC SURGERY DISCHARGES						
COMPARISON OF USE RATE-BASED PROJECTIONS						
WASHINGTON METROPOLITAN REGION						
(Region defined by patient residence)						
	<u>ACTUAL</u>					
	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
Adult population	2,371,517	2,409,393	2,444,123	2,478,620	2,509,571	2,539,635
Adult cardiac surgery discharges	2,075	2,172	1,917	1,819	1,740	1,840
Discharges per 100,000 population	87.5	90.1	78.4	73.4	69.3	72.4
3 year average annual change in use rate						-0.3%
6 year average annual change in use rate						-3.5%
	<u>PROJECTED</u>					
	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
Projected discharges @ 3 year average annual change in use rate	1,867	1,897	1,921	1,946	1,974	2,005
Projected discharges @ 6 year average annual change in use rate	1,803	1,768	1,728	1,688	1,651	1,615
<i>Difference: Number of discharges</i>	<i>64</i>	<i>129</i>	<i>193</i>	<i>258</i>	<i>323</i>	<i>390</i>

Sources:

(1) Population: Nielsen SiteReports

(2) Discharges:

(a) HSCRC Abstract Database, CY2008-2013

(b) DCHA Database, CY2008-CY2013

Notes:

(1) Adults defined as age 15+ years

(2) Use rates/use rate changes reflects age cohort-specific calculations

(7) Financial Feasibility

A proposed new or relocated cardiac surgery program shall be financially feasible and shall not jeopardize the financial viability of the hospital.

- (a) Financial projections filed as part of a Certificate of Need application shall be accompanied by a statement containing each assumption used to develop the projections.**
- (b) An applicant shall document that:**
 - (i) Its utilization projections for cardiac surgery are consistent with observed historic trends in the use of cardiac surgery by the population in the applicant's proposed service area;**
 - (ii) Its revenue estimates for cardiac surgery are consistent with utilization projections and account for current charge levels, rates of reimbursement, contractual adjustments and discounts, bad debt, and charity care provision, for cardiac surgery, as experienced by similar hospitals;**
 - (iii) Its staffing and overall expense projections for cardiac surgery are based on current expenditure levels and are consistent with utilization projections and with reasonably anticipated future staffing levels as experienced by the applicant hospital, or, if applicable, the recent experience of similar hospitals; and**
 - (iv) Within three years or less of initiating a new or relocated cardiac surgery program, it will generate excess revenues over total expenses for cardiac surgery, if utilization forecasts are achieved for cardiac surgery services.**

APPLICANT RESPONSE

As documented in 10.20.10.04.B(13), Certificate of Need Standards for Acute Care Hospitals, Financial Feasibility, the proposed project is financially feasible and is projected to generate a positive margin in program years 2 and 3.

The following section presents the basis for utilization projections, revenue estimates, staffing models, and expense projections.

Volume projections

Volume projections are defined by adult cardiac surgery discharges, based on procedure codes defined in Maryland regulations for Specialized Cardiac Services. AAMC projected its cardiac surgery discharges based on projected use rates for the defined service area and based on AAMC’s target market share for cardiac surgery in the defined service area. These projections are consistent with the following utilization trends:

- Volume growth in service area - Between CY2012-2013, adult cardiac surgery volume in each of the subregions grew considerably, reflecting population growth rates, the aging of this population, and the plateauing of use rates.

Chart 34
Number of Adult Cardiac Surgery Cases¹⁷

	CY2012	CY2013	% Growth
Anne Arundel County	444	513	15%
Four Midshore Counties	130	178	37%
Prince George’s & Calvert Counties: AAMC Segments	216	254	17%
Total	790	945	20%

- Expectations for reducing outmigration – In CY2013, a total of 339 cardiac surgery cases from this region (or 36% of discharges) were served at the WHC. AAMC expects to redirect more than 200 cases now treated at Washington, DC hospitals to AAMC’s new program; volume projections are based on the assumption that patients, physicians, and payers will drive this change based on the preference for continuity of care, proximity to home, access to surgeons from JHM, and greater affordability of the program at AAMC.

Case mix and utilization per discharge: Assumptions

The fundamental premise is that the mix of cases at AAMC and the utilization patterns accompanying this volume will be comparable to the FY 2014 utilization profile at other non-academic medical centers in Maryland for cardiac surgery cases. Based on a composite profile of

¹⁷ This chart is Chart 1 provided earlier in this application.

all adult cardiac surgery cases at non-academic medical centers in Maryland, the following volumes by APR-DRG were assumed:

**Chart 2 (repeated from page 62)
Number of Transfers**

<u>APR-DRG</u>	<u>Description</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>
4	Tracheostomy W Long Term Mechanical Ventilation W Extensive Procedure	3	4	4
162	Cardiac Valve Procedures W Cardiac Catheterization	23	32	37
163	Cardiac Valve Procedures W/O Cardiac Catheterization	60	84	97
165	Coronary Bypass W Cardiac Cath Or Percutaneous Cardiac Procedure	91	127	146
166	Coronary Bypass W/O Cardiac Cath Or Percutaneous Cardiac Procedure	64	90	103
	Total	241	337	387
	Current Inpatient Transfer Cases from AAMC	179		
	<i>Transfers as a percentage of projected volume</i>	74%		

For each APR-DRG listed above, AAMC is assumed to have the same utilization profile by HSCRC rate center as is documented for cardiac surgery patients at non-academic medical centers in Maryland. This produced the following assumptions for financial projections:

- Average length of stay = 8.5 days
- CMI = 3.42

(b)(ii) Revenue estimates

Anne Arundel’s charge per case for cardiac surgery is derived from its average charge per case at a CMI of 1.0 (\$10,962) and the average case mix of non-AMC OHS providers (3.4209) as \$37,501:

$$\$37,501 = \$10,962 * 3.4209$$

In addition, projected incremental revenue was reduced for the impact of cases currently transferred from AAMC to other hospitals, cases which are expected to remain at AAMC and convert to cardiac surgery cases at AAMC.

The revenue projections assume that AAMC’s GBR will be adjusted for incremental volume related to the project (incremental cardiac surgery revenue less transfer cases) at an 85% variable cost factor for the first three years of the project.

Deductions from revenue are estimated to be 15.3% based on AAMC’s actual experience for regulated services year to date in FY 2015. These deductions include uncompensated care, contractual allowances, and assessment payments.

The resulting net operating revenue for FY 2017, 2018 and 2019 is \$5,440,821, \$8,025,976, and \$9,345,110, respectively. Please see Table J.

(b)(iii) Staffing Model

Expenses reflect staffing models that were prepared by AAMC clinicians and administrators in consultation with cardiac surgery programs at other community hospitals in Maryland, and supported by “benchmark information” provided by consultants working in the area of cardiac services planning.

**Chart 3 (repeated from page 63)
Staffing Projection**

	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>
<u>Administration</u>			
Management	0.5	0.5	0.5
<u>Direct Care Staff</u>			
Physician Assistant	1.1	1.1	1.1
RN	18.0	20.6	21.7
<u>Support Staff</u>			
Technical	10.2	11.5	12.3
Professional	0.5	0.5	0.5
Total FTEs	<u>30.4</u>	<u>34.2</u>	<u>36.2</u>

(b)(iv) Expense projections

Salary assumptions for hospital staff were based on AAMC’s current salary structure, by position. Fringe benefits were assumed to be 19.4% based on FY 2014 actual experience.

AAMC has partnered with Johns Hopkins Hospital in the delivery of cardiac surgical services. JHH will provide cardiac surgeon and perfusionist coverage through this partnership.

Other expense projections were prepared by AAMC clinicians and administrators in consultation with cardiac surgery programs at other community hospitals in Maryland and with “benchmark information” provided by consultants working in the area of cardiac services planning.

Consistent with revenue assumptions, incremental expenses related to cardiac surgery cases were reduced for the variable costs related to those transferred cardiac surgery cases which will become cardiac surgery cases of AAMC.

The resulting net operating expense for FY 2017, 2018 and 2019 is \$6,945,043, \$8,010,222, and \$8,473,780, respectively. Please see Table J.

Capital costs and depreciation

AAMC will be funding the capital costs associated with the project out of existing cash reserves. AAMC will incur \$2.5 million in capital costs which will be depreciated as follows:

AAMC will incur \$2.5 million in capital costs which will be depreciated as follows:

**Chart 4 (repeated from page 64)
Capital Depreciation**

	Capital Costs	Depr. Life (yrs)	Annual Depr. Exp.
Renovations	\$451,000	20	\$22,550
Equipment	2,049,381	7	292,769
Total	\$2,500,381	7.93	\$315,319

Overall financial performance

AAMC is projected to generate revenues in excess of total expenses including incremental depreciation by Year 2 of the new program. The resulting income (loss) from operations for FY 2017, 2018 and 2019 is (\$1,504,222), \$15,755, \$871,330, respectively. Please see Table J. AAMC currently has a positive operating margin and is projected to maintain a positive operating margin including Year 1 of the new program and throughout the projection period.

(8) Preference in Comparative Review

In the case of a comparative review of applications in which all policies and standards have been met by all applicants, the Commission will give preference based on the following criteria.

- (a) The applicant whose proposal is the most cost effective for the health care system.**
- (b) An applicant with an established record of cardiovascular disease prevention and early diagnosis programming that includes provisions for educating patients about treatment options.**
- (c) An applicant with an established record of cardiovascular disease prevention and early diagnosis programming, with particular outreach to minority and indigent patients in the hospital's regional service area.**
- (d) An applicant whose cardiac surgery program includes a research, training, and education component that is designed to meet a local or national need and for which the applicant's circumstances offer special advantages.**

APPLICANT RESPONSE

AAMC's proposed cardiac surgery program should be given preference in this review based on its well documented and demonstrated ability to meet the four preference criteria.

- (a) The proposed project is highly cost effective. First, it will generate \$7.7M in total health care spend savings for the residents of Maryland. In addition, it will generate one of the lowest charges per case for all cardiac surgery programs in the region and in Maryland. And finally, it will have a \$2M positive impact on the Medicare Waiver Test.
- (b) The program is built upon more than a century of cardiovascular disease prevention and early diagnosis interventions that has reached thousands of individuals in our area and diverse communities, offering educational and screening services for them and their families.
- (c) These disease prevention and early diagnosis programs are specifically targeted towards those populations most at risk for cardiovascular disease.
- (d) Johns Hopkins Medicine brings its world-renowned research, training and education to this project - a hallmark of this program. JHM has the ability to train a new generation of clinical and translational researchers, and engage communities in clinical research efforts through a nationwide network of research universities. Furthermore, training will be coordinated through The Johns Hopkins Cardiothoracic Surgery Residency program, which is a fully accredited ACGME (Accreditation Council for Graduate Medical Education) training program in all aspects of cardiac and thoracic surgery which leads to specialty certification by the American Board of Thoracic Surgery (ABTS).

A. AAMC'S COST EFFECTIVE PROPOSAL FOR THE HEALTH CARE SYSTEM.

AAMC has presented in this application in several locations that the proposed cardiac surgery program is will be a least one of the lowest cost programs for the patients in our region.

- As presented in 10.20.10.04.B(4), Certificate of Need Standards for Acute Care Hospitals, Adverse Impact, AAMC is not asking for relief in rates changes for construction costs nor adversely affecting the services currently provided or the rates that are charged for those services.
- As presented in 10.20.10.04.B(5), Certificate of Need Standards for Acute Care Hospitals, Cost Effectiveness, AAMC evaluated numerous of service and site alternatives, ultimately selecting a course that minimizes the consumption of resources that would be taken from services. The patients in our region for cardiac surgery services will benefit from the continued low cost structure at AAMC.
- As presented in 10.20.10.04.B(13), Certificate of Need Standards for Acute Care Hospitals, Financial Feasibility, AAMC demonstrated the ability to create a sustainable program that meets the need for access in our region.
- As presented in 10.24.17.05(2), Certificate of Need Standards for Cardiac Surgery Programs, Impact, the projected shift of volumes to the AAMC program will not have a significant impact on the financial viability of any existing cardiac surgery program and thus cause indirect cost growth elsewhere in the health care system.
- As presented in 10.24.17.05(4), Certificate of Need Standards for Cardiac Surgery Programs, Cost Effectiveness, the AAMC payment rates are projected to be lower than any of the payment rates for cases at the existing hospitals.

As indicated previously in this application, hospitals in Maryland are now subject to the Maryland All-Payer Model Agreement (the Demonstration), an Agreement between the Office of the Governor of Maryland, the Center for Medicare and Medicaid Services, the Health Services Cost Review Commission (HSCRC) and the Maryland Department of Health and Mental Hygiene. The new agreement requires the calculation of two annual tests referred to herein as the Medicare Waiver Test and the All Payer Waiver Test. In accessing the cost effectiveness of any new program, it is important to understand the implication of that program on the two tests.

Implications for the Medicare Waiver Test

The project will give Maryland additional room under the Medicare Waiver Test by redirecting volume from the Washington Hospital Center, a high-cost provider not subject to the limits imposed by Maryland's rate-setting regime.

The Medicare Waiver Test differs from the All-Payer Waiver Test in that it includes all hospital claims for Medicare fee for service (FFS) beneficiaries residing in Maryland, including claims of hospitals that are not located in Maryland. Therefore, the claims of the Washington DC hospitals for cardiac surgery services to the residents of the AAMC patient service area (PSA) are included in the Base Year (2013) claims of the Medicare Waiver Test. As such, the relocation of acute care services from Washington, DC hospitals to AAMC will impact the Medicare Waiver Test.

The aggregate impact of the AAMC cardiac surgery program on the Medicare Waiver Test has three components.

- The HSCRC will approve an adjustment to AAMC’s GBR target budget to fund the incremental costs of the cardiac surgery program in the particular year. The Medicare component of these adjustments will increase Medicare claims and thereby affect be favorable to the Medicare Waiver Test.
- The HSCRC will reduce the GBR target budgets of those cardiac surgery hospitals in Maryland that lose cardiac surgery cases to the AAMC cardiac surgery program. The Medicare component of these adjustments will decrease Medicare claims and thereby be favorable to the Medicare Waiver Test.
- The relocation of cardiac surgery services from the Washington, DC hospitals to the AAMC cardiac surgery program will decrease Medicare claims and thereby be favorable to the Medicare Waiver Test.

Chart 35 calculates the number of Medicare CMADs attributable to the Medicare component of AAMC’s GBR target budget adjustment in FY-2018 related to the cardiac surgery program, using a Medicare case mix index of 3.71.

Chart 35
Medicare CMADs
The AAMC Target Budget for Cardiac Surgery: FY 2018

(1) Medicare Cases	172
(2) Medicare Case mix Index	3.71
(3) CMADs (1)x(2)	638

The Medicare Component of the Reduction to the GBR target budget of the Maryland cardiac surgery hospitals (the Market Share Adjustments)

Chart 35 shows that the projected FY 2018 Medicare cases of the AAMC cardiac surgery program (172) accounted for 638 CMADs. In the aggregate, the projected FY 2018 cardiac surgery cases (337) account for 1152 CMADs, reflecting an average case mix of 3.4209 (337 x 3.4209). Therefore, the Medicare services of the AAMC program account for 55.3% of the program's total services.

$$0.553 = 638 / 1152$$

The aggregate incremental charges of the AAMC target budget for cardiac surgery are \$9,475,784. Therefore, the Medicare charges included in the target budget are \$5,240,109, the product of the Medicare proportion of CMADs (.553) and the aggregate incremental charges of the AAMC target budget:

$$\$5,240,109 = .553 * \$9,475,784$$

Medicare payments, including the two percent sequestration adjustment, will equal 92 percent of these charges, or \$4,820,900:

$$\$4,820,900 = .92 * \$5,240,109$$

Chart 36, below, uses the Medicare share of services to calculate the Medicare component of the Market Share Adjustments of the Maryland cardiac surgery hospitals attributable to cardiac surgery cases relocated to the AAMC cardiac surgery program.

Chart 36
The Medicare Component of the MSAs
FY 2018

	UMMS	JHH	OTHER	TOTAL
(1) Market Share Adjustments (Chart 38 below, line 5)	\$1,013,179	\$2,352,042	\$269,825	\$3,635,059
(2) Medicare Share of Cardiac Surgery Services				0.553
(3) Medicare Component of MSAs (1)x(2)				\$2,010,188
(4) Decline in Medicare Payments (.92x(3)) (including Sequestration)				\$1,849,373

The decline in the payments to the Maryland cardiac surgery hospitals will offset the Medicare component of the incremental charges and payments calculated above for the AAMC cardiac surgery program, an offset similar to the offset for the AAMC's global budget adjustments in the calculation of the impact of the program on the All-Payer Waiver Test. However, unlike the All-

Payer Waiver Test, the Medicare Waiver Test involves an additional offset equal to the reduction in payments to Washington, DC hospitals as a result of cardiac surgery cases being relocated from Washington, DC hospitals to the AAMC cardiac surgery program.

Chart 10 projects that 116 Medicare cases will be relocated from Washington, DC hospitals to the AAMC program; 111 of these cases are expected to be relocated from the Washington Hospital Center (WHC). To simplify the calculation of the decrease in Medicare payments to the Washington, DC hospitals associated with these relocated Medicare cases, we assume that the average payment rate for these 116 cases is \$44,080, the Medicare payment for cardiac surgery cases at the WHC adjusted for the case mix of AAMC. This amount was derived from CY2013 MedPAR data updated for FY 2014:

Since 116 Medicare cardiac surgery cases will be relocated from the Washington, DC hospitals to the AAMC program, the reduction in Medicare payments for these cases will be \$5,113,280, the product of the 116 cases multiplied by the average Medicare payment per case (\$44,080):

$$\$5,113,280 = 116 \times \$44,080$$

Chart 37, below, summarizes the increases and decreases in Medicare payments associated with the AAMC cardiac surgery program and calculates the favorable impact of the changes in Medicare payments on the Medicare Waiver Test over a twelve month period of the program. These calculations assume that Medicare hospital payments for FFS beneficiaries residing in Maryland are \$6.0 billion.

Chart 37
Impact on the Medicare Waiver Test
Twelve Month Period of FY-2018*

Medicare Payment Increases: the Medicare Component of the Cardiac Surgery Program Adjustments to AAMC's GBR Target Budget (Chart 35)	\$4,820,900
Medicare Payment Decreases	
(1) the Medicare Component of the Market Share Adjustments of the Maryland Cardiac Surgery Hospitals (Chart 36)	(\$1,849,373)
(2) the Reduction in Payments to the DC Hospital	(\$5,113,280)
Total	(\$2,141,753)
Medicare Hospital Payments on behalf of Maryland Residents	\$6,000,000,000
Favorable Impact on the Medicare Waiver Test	(0.00036)= (0.036%)

* The actual Medicare Waiver Test is calculated on a calendar year basis. FY2018 volumes are used here for illustrative purposes. However, the same favorable results would be found over a calendar basis using similar volumes.

The calculation on Chart 37 shows that the effect of the AAMC cardiac surgery program on the Medicare Waiver Test over and the twelve month period of FY2018, will be to decrease relevant Medicare payments by 0.036%, and therefore positively advantage Maryland in meeting this test.

Implications for the All-Payer Waiver Test

The All-Payer Model Demonstration (the Demonstration) places a cumulative annual limit on the all-payer total hospital revenue growth of Maryland residents receiving care at Maryland hospitals covered by the Demonstration (the All-Payer Waiver Test). Therefore, if the AAMC cardiac surgery program were to incrementally increase the total Maryland hospital revenue of Maryland residents in a particular year, this incremental increase would add to the Maryland hospital revenue included in the All-Payer Waiver Test for that year, thereby reducing the annual limit available to the other Maryland hospitals in that year.

The AAMC cardiac surgery program will result in increases or decreases in the total Maryland hospital revenue covered by the All-Payer waiver test in each of the program's startup years in two ways:

- The HSCRC will approve an adjustment to AAMC's GBR target budget to fund the incremental costs of the cardiac surgery program in the particular year, thereby increasing Maryland hospital revenues.
- The HSCRC will reduce the GBR target budgets of those cardiac surgery hospitals in Maryland that lose cardiac surgery cases to the AAMC cardiac surgery program, thereby decreasing Maryland hospital revenues.

AAMC has projected that the net incremental gross revenue (adjusted for the impact of cases currently transferred from AAMC to other hospitals which are expected to convert to cardiac surgery cases at AAMC) required to fully fund the cardiac surgery program in FY 2018 will be \$11,147,981 (\$37,501 times 337 cases less estimated retained transfer revenue of \$1,489,856) and has requested an adjustment to the hospital's GBR target budget of 85% of this amount, or \$9,475,784. In FY 2018, the cardiac surgery program is projected to serve 337 cases so that the average incremental revenue per case will be \$28,118.

The accumulated reduction in the GBR target budgets for the JHH, the University of Maryland Medical Center and the other Maryland hospitals in the twelve months for FY 2018 presented in Chart 38 below.

Chart 38
The AAMC Cardiac Surgery Program
Accumulated Reductions in the GBR Target Budgets:
Maryland Cardiac Surgery Hospitals
FY 2018

	UMMS	JHH	Other	Total
(1) FY 2014 Average Charge per CMAD	\$20,427	\$19,929	\$13,145	
(2) Cardiac Surgery Case mix for AAMC projected cases	3.4209	3.4209	3.4209	
(3) Calculated Cardiac Surgery Charge per Case	\$69,878	\$68,174	\$44,971	
(4) Volume Reduction for relocated cases	29	69	12	
(5) Total Revenue for Volume Reduction	\$2,026,462	\$4,704,006	\$539,649	
(6) Accumulated Reductions in GBR Target Budgets (5)At 50% VCF	\$1,013,231	\$2,352,003	\$269,825	\$3,635,059

Source:

HSCRC Discharge Abstracts

The accumulated increase in Maryland hospital revenue over the first two years of the AAMC cardiac surgery program is therefore projected to be \$5,840,725, the difference between the program's aggregate incremental charges in FY 2018 (\$9,475,784) and the accumulated adjustments to the target budgets of the Maryland cardiac surgery hospitals (\$3,635,059).

$$\$5,840,725 = \$9,475,784 - \$3,635,059$$

This amount would be fully accounted for in the All-Payer waiver test if all cases at the AAMC cardiac surgery program and all cases at the cardiac surgery programs at the Maryland cardiac surgery hospitals that were relocated to AAMC involved services to Maryland residents. While it is probable that these cases will involve persons who reside outside of Maryland, the number of such cases will be small and will have little effect on the projected Maryland hospital revenue increases associated with the AAMC cardiac surgery program.

The impact of the increase in Maryland hospital revenues on the All-Payer waiver test over the twelve months of the program calculated above can be estimated using the assumption that the total Maryland hospital revenue for services to Maryland residents is \$14.1B. Chart 39 calculates the impact of the AAMC cardiac surgery on the All-Payer waiver test for the twelve month period.

Chart 39
Impact on the All-Payer Waiver Test
Twelve Month Period of FY-2018*

1. AAMC Cardiac Surgery Aggregate Charges FY-2018	\$9,475,784
2. Accumulated Target Budget Adjustments	\$3,635,059
3. Incremental AAMC Cardiac Surgery Revenue	\$5,840,725
4. Maryland Hospital Charges for Services to Maryland Residents	\$14,100,000,000
5. % Impact of AAMC Cardiac Surgery	.00041 (=0.041%)

* The actual All Payer Waiver Test is calculated on a calendar year basis. FY2018 volumes are used here for illustrative purposes. However, the same favorable results would be found over a calendar basis using similar volumes.

In any one year period the all-payer per capita total hospital revenue growth will be limited to a fixed annual amount which is likely to be 3.58%. The impact of AAMC's cardiac surgery program will be to reduce this one year revenue growth limit from 3.58% to 3.54%. This change of four one-hundredths of one percent (0.04%) is negligible.

Impact to the Waiver as a Whole

It is in Maryland's best interest to trade an improvement in the Medicare Waiver Test for an erosion in the All-Payer Waiver Test, for two reasons.

First, Maryland currently has a wide cushion under the All-Payer Waiver Test.

Second, the Health Services Cost Review Commission has many levers to address the All-Payer Waiver Test, because that test rests entirely on Maryland hospital revenues. In contrast, the Medicare Waiver Test measures per-beneficiary Medicare spending on Maryland residents in any hospital, including those hospitals located outside of HSCRC jurisdiction.

Third, the Medicare Waiver Test is more difficult to manage. It compares the relative growth of Medicare expenditures of Maryland residents vs. Medicare beneficiaries nationwide. The HSCRC cannot easily predict, and cannot control, nationwide Medicare expenditures. This project would improve Maryland's performance in this race.

Impact to the "Total Health Care Spend"

The analyses above documents the impact of the new program at AAMC on two measurements contained in the Medicare Demonstration model (the Medicare Waiver Test and the All-Payer Test).

However, it should be remembered that the Waiver Tests are just that: Tests. Although it is very important to meet these tests, the goal of the MHCC and the HSCRC is not to meet the tests, it is to guide the health care delivery system in achieving Maryland's goal of better health, better care, at lower cost. This project achieves these three fundamental aims.

In that regard, the project achieves an overall savings to the health care delivery system. Private payers and patients currently carry substantially higher costs at non-Maryland hospitals. The savings to be produced by AAMC's new program are significant and must be recognized as a critical objective of establishing a lower cost, high quality cardiac surgery program in this region.

In this context, the full impact of the new cardiac surgery program is estimated below, and demonstrates a net reduction of \$7.74 million in hospital spending:

Chart 40
Cardiac Surgery Program at Anne Arundel Medical Center
Net Impact
FY2018

	FY 2018				
	Cases	Average Payment	Total Payment	VCF	Payment @ VCF
AAMC Projected Cardiac Surgery Cases	337	\$37,501	\$12,637,837	85%	\$10,742,161
Less: Existing Transfer Revenue	178	(8,370)	(1,489,856)	85%	(1,266,377)
Incremental Revenue	337	\$33,080	\$11,147,981	85%	\$9,475,784
Estimated Payment @ 95.6%					\$9,058,850 [A]
<i>Impact on Existing Cardiac Surgery Hospitals:</i>					
DC Hospitals ^[1,2]	(227)	\$58,681	(\$13,320,587)	100%	(\$13,320,587)
<u>Maryland Hospitals</u> ^[3]					
Johns Hopkins Hospital	(69)	65,174	(4,497,006)	50%	(2,248,503)
University of Maryland Medical Center	(29)	66,803	(1,937,287)	50%	(968,644)
Washington Adventist Hospital	(6)	45,034	(270,204)	50%	(135,102)
Sinai Hospital	(3)	46,187	(138,561)	50%	(69,281)
MedStar Union Memorial Hospital	(2)	46,963	(93,926)	50%	(46,963)
UM St. Joseph Medical Center	(1)	36,958	(36,958)	50%	(18,479)
Total Estimated Payment	(337)	\$60,221	(\$20,294,529)	83%	(\$16,807,558) [B]
Net Savings on Total Health Care Spend					(\$7,748,708) [A-B]

Notes:

[1] DC Hospitals defined as Washington Hospital Center (221 cases) and George Washington University Hospital (6 cases)

[2] DC hospital payments estimated as a blend of payments for Medicare and non-Medicare payments in the same proportion. The Medicare payment was derived from CY 2013 MedPar Data updated for FY 2014 and the non-Medicare payment was derived from payment calculations for area residents at DC hospitals.

[3] Payment discount calculated at 4.4% (95.6%), a blend of the 8% discount for Medicare (55.3% of cases) and no discount for non-Medicare cases (44.7% of cases)

B. CARDIOVASCULAR DISEASE PREVENTION AND EARLY DIAGNOSIS PATIENT EDUCATION

AAMC continues to distinguish itself as a proponent and advocate for community health programs as evidenced by a strong history of providing risk reduction and prevention programs, education, and health screenings related to heart disease to the communities served by the health system. AAMC has also developed and implemented robust plans to improve access to medical experts and health services throughout the region. (see Exhibit 5(b), Community Outreach).

Anne Arundel County outpaces the nation when it comes to heart disease and death due to heart disease. In fact, heart disease is the leading cause of death in Anne Arundel County, for both men and women. This was the finding of a 2012 Community Health Needs Assessment (CHNA) performed in collaboration with more than 50 partners, including the area's major hospitals, mental health providers, community aid organizations, foundations, and the Anne Arundel County Department of Health. The purpose of the CHNA was to determine the community health improvement planning needs of Anne Arundel County.

AAMC takes two approaches in its outreach activities. First, AAMC directly provides health education and screening programs on its own. Second, AAMC supports existing partners and their activities to share evidence-based practices and develop community networks. Our partners include government entities, faith-based groups, non-profit organizations, schools, businesses, and the local health improvement coalition. AAMC has an extensive program that reaches into the poorest communities surrounding Annapolis.

The goal of AAMC's community outreach program is to expand health programs beyond the walls of the hospital and into the community it serves, thereby alleviating barriers such as transportation and cost. In FY 2013, AAMC invested \$3,998,463 in outreach activities and dedicated 19.6 FTEs to providing outreach programs. In FY 2014, AAMC invested \$4,255,996 in outreach activities and dedicated 22.4 FTE to providing the programs. AAMC's mission is to enhance the health of the people we serve, and AAMC recognizes and takes responsibility for its role in improving the health of the community by developing programs, and investing in systematic changes that will reach the underserved and minority communities in the Medical Center's service area.

AAMC's commitment to serving the community and improving the health of the residents has been recognized with the following awards:

January, 2015 Cycle IV Chest Pain Center Accreditation

November, 2014	Martha Wood Leadership Award for Community Outreach (recognized by the city of Annapolis for efforts and collaboration with the Housing Authority)
November, 2014	Cited for best practices in patient and family centered care in the <i>Advancing Excellence: Best Practices in Patient and Family Engagement Recognition Program report</i> . (Recognized by the Caregiver Action Network)
September, 2014	Magnet Recognition Accreditation
September, 2014	Delmarva Foundation Recognition for Quality Improvement in Hospitals
April, 2014	Level 1 Facility, Weight Loss and Metabolic Surgery (Am. Coll. Of Surg.)
July, 2013	Delmarva Foundation Recognition for Quality Improvement in Hospitals
April, 2013 Center)	Circle of Honor Award for Patient Safety (Maryland Patient Safety
December, 2012	Press Ganey Award for Patient Satisfaction and Quality Improvement
December, 2012	Leapfrog Top Hospital
November, 2012	Gold Fit Friendly Worksite Awards (American Heart Association)
April, 2012	Cycle III Chest Pain Center Accreditation (Society of Cardiovascular Patient Care)
2011	American College of Cardiology Foundation's NCDR ACTION Registry--GWTG Gold Performance Achievement Award

AAMC's Outreach Programs

The overall goal of AAMC's community outreach programs is to reduce the incidence and mortality related to heart disease, with the strategic objective of driving patients to primary care (or appropriate medical specialists) for clinical oversight and management to reduce risk factors related to heart disease. Much of the underserved community lacks access to primary care due to the inability to pay for health insurance. Therefore it becomes imperative to touch lives through awareness and education programs to drive residents towards prevention and risk reduction strategies that are no or low cost. Some programs are conveniently offered at the hospital--

AAMC is on a bus line, which reduces a barrier to care. Most programs, however, are offered in community settings such as faith-based organizations, senior housing centers, homeless shelters, businesses, community centers, and schools in AAMC's primary and secondary service areas and adjacent communities.

AAMC's community outreach program is designed to raise awareness about risk factors, particularly those related to heart disease. It is critical that community-based programs help patients and residents navigate back to their primary care provider for follow up and management of risk factors in order to reduce the incidence of critical heart morbidities. Patients who have critical or above baseline screening results will be referred back to the primary care provider to control hypertension and cholesterol and introduce aspirin therapy where appropriate to improve the quality of care for individuals (Million Hearts Campaign, 2014).

Primary care providers will utilize existing tools in the electronic medical record (EMR) to document and facilitate care plans that can help monitor and reduce the incidence of heart disease and related risk factors for patients. These tools can provide reminders to primary care providers for preventive services, including screenings for heart disease, assessment of a patient's risk of developing heart disease, recommendations for behavior modification, and alerts when screenings are not at goal. These systems will also send patient reminders for follow up care related to their heart disease.

The Johns Hopkins Center to Eliminate Cardiovascular Health Disparities

AAMC and Johns Hopkins University are both committed to eliminating barriers to quality health care. Hopkins has founded the Johns Hopkins Center to Eliminate Cardiovascular Health Disparities (JHCHD), a collaboration among the Bloomberg School of Public Health, the School of Medicine, the School of Nursing and Johns Hopkins Community Physicians. The center's primary mission is to improve health and reduce/eliminate cardiovascular health disparities among Baltimoreans through innovations in patient/community education, clinical training, research and medical care. The center is administered by Lisa Cooper, M.D. and is funded by a P-50 grant from the National Heart, Lung and Blood Institute as one of the Centers for Population Health and Health Disparities (CPHHD) as well as with additional support from institutional and philanthropic sources. The center's mission, organizational structure and the 3 primary current clinical trials are detailed on the centers website.

<http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-to-eliminate-cardiovascular-health-disparities/about/contact.html>

AAMC will partner with Dr. Cooper and JHCHD to develop programs to study and work towards the elimination of disparities in access to cardiovascular services in Ann Arundel County. The goal of the AAMC-Hopkins collaboration to:

- Establish a community advisory board
- Conduct research to test programs to improve management and outcomes of cardiovascular diseases
- Offer training to health care practitioners in the elimination of disparities in the care of cardiovascular disorders
- Provide educational resources to assure that the results of disparity research are used to benefit the community
- Work with government officials to develop policies to improve access to cardiovascular services

Research protocols at JHCHD are focused on reducing hypertension rates and disparity through provider education, increased patient education, and on-going blood pressure monitoring. Currently, AAMC, under the umbrella of its Accountable Care Organization, tracks metrics for hypertension including the screening for hypertension in the general population and the control of blood pressure in patients diagnosed with hypertension. As a result, blood pressure is a focus of each primary care doc in the ACO. Furthermore, AAMG primary care practice staff has been trained systematically in how to measure blood pressure accurately. Many of the primary care physicians counsel patients about smoking cessation, proper nutrition, physical activity and moderation of alcohol intake as measures that help control blood pressure. This process and metrics can be readily transferred into the research protocols established at JHCHD.

AAMC heavily promotes heart health education and outreach each February for American Heart Month. In 2014, AAMC endorsed the Million Hearts Campaign guidelines and educational programs to increase awareness about heart disease prevention and empower patients to take control of their heart health by understanding the risks. The following key messages have been provided to the community through AAMC's community publications, media campaigns, signage around the medical center and in the community, and participation in classes and health fairs throughout Anne Arundel County and AAMC's service area.

- GET UP and GET ACTIVE by exercising for 30 minutes several days a week.
- KNOW your ABCS:
 - Appropriate Aspirin Therapy
 - Blood Pressure Control
 - Cholesterol Management
 - Smoking Cessation

- STAY STRONG by eating a heart-healthy diet that is high in fresh fruits and vegetables and low in sodium, saturated and trans fats, and cholesterol.
- TAKE CONTROL of your heart health by following your doctor’s instructions for medications and treatment.

During February of 2013 AAMC focused on community education related to the signs and symptoms of a heart attack or other acute coronary syndromes, and the importance of calling 9-1-1. The emphasis for this campaign included education around atypical signs of a heart attack, understanding risk factors associated with heart disease, and the importance of calling 9-1-1 for a suspected heart attack. The ability of Emergency Medical Services (EMS) to transmit an EKG to the hospital prior to a patient’s arrival in the Emergency Department was emphasized.

These educational messages were promoted in AAMC Magazine, on AAMC’s website and social media channels, in internal newsletters and around the medical center campus, and through the on-hold message system. In addition, DocsTALK, a live health education community program, explored key messages in heart health through the show entitled, “From Head to Toe: Preventing Clogged Arteries.” This program had 340 community members in attendance.

The purpose of the educational campaigns and promotions is to create awareness among residents about their risk for heart disease and what to do when they or someone they know experiences a heart attack or other serious heart event. These campaigns touch all corners of the county through television, radio, print, and community events and fairs.

Cardiovascular Outreach Encounters

The following events and programs were held in FY 2013 to promote heart health and provide education related to heart health from the perspectives of prevention, risk reduction, related co-morbidities, and access. The purpose of these events is to engage community members in the process of taking care of themselves.

Health Fairs to Promote Heart Health:

7/31/2012	Bay Ridge Gardens	60 encounters
8/4/2012	Mills Parole Elementary School	75 encounters
8/17/2012	Saval Foods Fair	100 encounters
8/18/2012	Newtowns 20 Fair	75 encounters

8/18/2012	Asbury UMC Fair	50 encounters
9/8/2012	Wayman Good Hope Church	75 encounters
9/21/2012	MD Dept of Housing Fair	200 encounters
9/26/2012	Vic. Park Senior Housing	150 encounters
9/27/2012	Heritage Harbor Health Group	100 encounters
9/29/2012	Heritage Church – Hispanic Outreach Fair	300 encounters
10/6/2012	Fire Fighters Union Fair	100 encounters
10/16/2012	Ginger Cove Fair	30 encounters
10/20/2012	Housing Authority of Annapolis Conference	150 encounters
10/20/2012	Grace Pointe Church	50 encounters
10/22/2012	Annapolis Gardens Fair	100 encounters
10/24/2012	DPI Fair	100 encounters
11/20/2012	Frito Lay Fair	100 encounters
12/1/2012	Kent Island High School Cardio Fit Fair	100 encounters
12/8/2012	Cornerstone Church – Christmas fair	50 encounters
12/14/2012	YPO event	50 encounters
2/7/2013	Northeast High School Heart Health Fair	200 encounters
2/10/2013	Walk with God in Body, Mind and Spirit	60 encounters
2/14/2013	South River High School Heart Health Fair	200 encounters
2/21/2013	Annapolis High School Heart Health Fair	200 encounters
2/28/2013	Glen Burnie High School Heart Health Fair	60 encounters

4/10/2013	Anne Arundel Community College	100 encounters
5/1/2013	City of Annapolis	300 encounters
5/12/2013	Annapolis City Dock Fair	50 encounters
6/1/2013	Bowie Fest	50 encounters
6/8/2013	First Baptist – Glenarden	50 encounters
6/12/2013	Langton Greene	50 encounters
6/22/2013	First Baptist Church	50 encounters
9/7/2013	Mexican Embassy Health Fair	50 encounters
9/26/2013	Northeast High School Back to School Night	100 encounters
10/12/2013	Fire Fighters Union Health Fair	50 encounters
10/22/2013	Mt Olive AME Weight Loss Challenge Kick off	50 encounters
12/7/2013	Cornerstone Church Health Fair	100 encounters
12/13/2013	Frito Lay Save A Life Fair	25 encounters
1/11/2-14	Kent Island High School Fitness Fair	50 encounters
2/9/2014	Light of the World Church – Red Dress Sunday	25 encounters
2/9/2014	Asbury UMC Red Dress Sunday	25 encounters
2/9/2014	First Christian Church Red Dress Sunday	25 encounters
2/23/2014	Mt Olive AME Red Dress Sunday	25 encounters
4/12/2014	Family Fun Festival	100 encounters
5/7/2014	Annapolis City Benefits Fair	50 encounters
5/16/2014	Naval Academy Alumni Association Fair	25 encounters

5/22/2014	Ginger Cove – Wellness and Exercise Day	50 encounters
6/7/2014	National Coalition of 100 Black Women	50 encounters
6/14/2014	SAVE your Life Health Fair	50 encounters
6/14/2014	Asbury Broadneck Quarterly Health Fair	15 encounters
8/23/2014	Kingdom Builders Church of God Fair	50 encounters
9/11/2014	Northrup Grummond Health Fair	50 encounters
9/12/2014	MD Department of Housing Health Fair	50 encounters
9/13/2014	Severna Park Fun Festival	50 encounters
9/25/2014	Heritage Harbuor Health Fair	50 encounters
10/12/2014	Centro D-Ayuda Hispanic Fair	25 encounters

Speakers Bureau:

7/18/2012	South County Senior Center – Diabetes	20 encounters
8/1/2012	Business Opportunity Network – Healthy Eating	18 encounters
9/6/2012	South County Senior Center - Diabetes	35 encounters
10/17/2012	St. Johns Women’s Luncheon – Heart & Vascular	25 encounters
10/24/2012	Teen Tobacco Road Show – Smoking Prevention	30 encounters
1/11/2013	Weight of the Nation Screening – Heart /Obesity	150 encounters
1/15/2013	Lyons Club - Diabetes	20 encounters
1/25/2013	Weight of the Nation – Obesity & Heart	40 encounters
2/7/2013	Mt Calvary Seniors Luncheon – Heart Health	20 encounters
2/19/2013	Tobacco Free Kids Week – Smoking cessation	30 encounters

2/19/2013	Lighthouse Shelter – Heart Health	15 encounters
2.24.2013	Grace Pointe Church – Heart Healthy Eating	30 encounters
3/10/2013	Holy Temple - Smoking Cessation	50 encounters
5/2/2013	Comptroller’s Office – Heart & Vascular Health	25 encounters
5/11/2013	Severna Park Community Ctr – Heart Health	30 encounters
5/15/2013	Broadneck Elementary School – Heart Healthy Eating	50 encounters
5/17/2013	Nantucket Elementary School – Heart Healthy Eating	75 encounters
6/7/2013	Severna Park Community Center – Heart Healthy Eating	75 encounters
FY2013	Throughout the Service line areas – Physician outreach	1000 encounters
7/22/2013	First Christian Community Church – Heart Healthy Eating	20 encounters
10/6/2013	Grace Pointe Church – Losing to Live/ Heart Health	20 encounters
10/12/2013	18 th Annual Women’s Wellness Weekend with the YMCA	20 encounters
10/21/2013	TOPS of Severna Park – Nutrition to Lose Weight	20 encounters
1/10/2014	Severna Park Community Center – Heart Health Talk	15 encounters
2/1/2014	Baywoods Senior Living Women & Heart Disease	40 encounters
2/5/2014	Severna Park Community Center – Heart Health	15 encounters
2/13/2014	Heart Check at Northrup Grummond	25 encounters
2/20/2104	New Annapolitans Heart Health Talk	25 encounters
2/21/2014	Wiley Bates Senior Housing – Heart Talk	25 encounters
3/5/2014	Chartwell Country Club – Heart Health Talk	50 encounters
3/12/2014	Key School – Heart Health Nutrition	100 encounters

3/19/2014	Wiley Bates Senior Housing – Heart Health Q&A	20 encounters
3/28/2014	Boys and Girls Club – Heart Health Nutrition	40 encounters
4/4/2014	Boys and Girls Club – Heart Health Nutrition	40 encounters
4/11/2014	Severna Park Moms Club – Heart Health & Nutrition	25 encounters
4/11/2014	Boys and Girls Club – Heart Health Nutrition	40 encounters
5/29/2014	Broadneck – Girls Night Out – Heart Health Nutrition	25 encounters
5/31/2014	St Matthews UMC – Men’s Health	25 encounters
6/18/2014	Westfield Mall – Heart Health Nutrition	10 encounters
6/18/2014	Wiley Bates Senior Housing – Heart Health Q&A	20 encounters
8/5/2014	Eastport Terrace Camp – Healthy Habits	50 encounters
9/24/2014	Seeds 4 Success Eastport Terrace – Nutrition and Exercise	20 encounters
10/1/2014	Seeds 4 Success Eastport Terrace – Nutrition & Exercise	20 encounters
10/3/2014	Community Preservation Healthy Aging	25 encounters
10/12/2014	Mt. Olive Blood Refresher Course	10 encounters
10/14/2014	Eastport Terrace – Heart Health	10 encounters
12/10/2014	Seeds 4 Success Eastport Terrace – Nutrition & Exercise	20 encounters

Support Groups: (meet monthly)

Annapolis Stroke Club	540 encounters
Diabetes Support Groups (Annapolis & Kent Island)	140 encounters
Young Adult’s Cardiac Support Group	120 encounters

Risk Factor Reduction/ Behavior Modification Programs

AAMC is committed to reducing the rate of heart disease in the community, including the underserved population, through programs that modify risk for the disease before intervention is necessary. AAMC has developed programs targeted in the community that address preventable risk factors such as tobacco use, obesity (diet and exercise), hypertension, diabetes, and harmful use of alcohol.

Tobacco Cessation

With smoking and tobacco use being the leading cause of preventable death worldwide, there has been a long standing history of AAMC promoting reduced tobacco use through programs and policy initiatives. Currently, the smoking cessation program has over 4,700 encounters each year through individual (inpatient and outpatient visits) and group interventions. AAMC spent \$101,167 helping individuals quit tobacco use in FY 2013. AAMC has also advocated for limited access to tobacco products. In 2013, AAMC sponsored a Mayo Clinic Nicotine Dependence course for tobacco cessation counselors across the region. While this was a professional conference that required tuition, 15 participants had access to a local evidence based training program. By partnering with the Conquer Cancer Advisory Council in Anne Arundel County, AAMC has helped to advocate for stricter tobacco product placement laws, restricting tobacco access to minors, and promoting a smoke-free lifestyle.

On July 1, 2014, AAMC implemented a strict smoke-free campus and workplace policy. While AAMC has been “smoke-free” since 2007, the most recent policy primarily focused on the medical park campus and was limited to cigarette use. The expanded policy applies to all AAMC facilities and tobacco-free zones include sidewalks, parking lots and garages. There are no areas designated for smoking or other tobacco use. The policy applies to all employees, physicians, patients, contract staff, vendors, volunteers, students, and visitors at all AAMC facilities. In addition, starting July 1, 2015 the hospital will not hire individuals who use tobacco products.

Obesity Prevention & Reduction

AAMC is also committed to obesity prevention and reduction in the community. Registered dietitians provided weight loss education to nearly 1,500 individuals in FY 2013. Some individuals attended the Mayo Clinic Weight Loss program, and others scheduled individual appointments with the dietitians. Individuals who are referred from AAMC’s low income clinics receive free nutrition counseling.

Energize, AAMC’s worksite wellness program, supported access to free nutrition counseling for employees and access to an on-site gym. Reduced cost passes for exercise classes are also available to employees. In FY 2013, employees lost nearly 2,600 pounds.

In addition, AAMC provides staff and resource support to the Healthy Anne Arundel Coalition’s Obesity Prevention Subcommittee (See Partnerships for more information).

Hypertension Awareness

Since many individuals are not aware of their blood pressure numbers, AAMC has provided blood pressure screening clinics in and around the community. Individuals who have high readings are navigated back to their primary care physician, or a referral is made to a provider. AAMC also has three HIGI blood pressure monitoring machines – two are on campus and the third is located in Westfield Annapolis Mall. These machines measure a person’s weight, BMI, pulse and blood pressure, and allow users to create a profile for ongoing reference to privately track their numbers and health. While health statistics are taken and measured, users are provided with health information on a video screen. Since the monitoring machines were established in February 2014, a blood pressure education video played 42,808 times and blood pressure readings were provided for 22,934 encounters. These machines have been useful to expand the “know your numbers” education campaign.

AAMC nurses have provided blood pressure screening clinics in the community as well. This has also expanded the “know your numbers” campaign in the community.

Blood Pressure Screenings in the Community

9/8/2012	Wayman Good Hope Church	75 encounters
12/2/2012	First Christian Church	21 encounters
12/4/2012	Lighthouse Shelter	21 encounters
12/5/2012	Community Health Clinic	13 encounters
12/7/2012	Severna Park Community Center	75 encounters
1/25/2013	Annapolis Gardens	28 encounters
2/1/2013	Go Red for Women BB& T Bank	40 encounters
2/8/2013	Go Red for Women BB&T Bank	17 encounters
2/10/2013	First Christian Church	22 encounters
2/15/2013	Go Red for Women BB&T Bank	26 encounters

2/16/2013	Westfield Mall	60 encounters
2/22/2013	Go Red for Women BB&T Bank	19 encounters
3/20/2013	Obery Court	20 encounters
4/24/2013	Obery Court	20 encounters
5/22/2013	Obery Court	25 encounters
6/15/2013	Harbor House Eastport Terrace Day	20 encounters
6/26/2013	Obery Court	15 encounters
6/29/2013	Shady Side	15 encounters
7/24/2013	Obery Court	15 encounters
8/28/2013	Obery Court	15 encounters
9/25/2013	Obery Court	15 encounters
10/5/2013	5th Annual Hispanic Outreach Fair	100 encounters
10/24/2013	Obery Court	15 encounters
10/26/2013	Grace Pointe Church	80 encounters
10/29/2013	ARINC Employee Benefit Fair	25 encounters
11/6/2013	AACPS Benefits Fair	25 encounters
11/9/2013	AACPS Benefits Fair	25 encounters
12/6/2013	Severna Park Community Center	10 encounters
1/28/2014	Annapolis Gardens	5 encounters
1/29/2014	Obery Court	10 encounters
2/26/2014	Obery Court	10 encounters

3/13/2014	Bay Ridge Gardens	10 encounters
3/26/2014	Obery Court	5 encounters
3/29/2014	Homeless Resource Day	50 encounters
4/1/2014	Eastport Terrace	25 encounters
4/5/2014	Blood Pressure Training – First Baptist Church	10 encounters
4/8/2014	Eastport Terrace	10 encounters
4/10/2014	Clergy Breakfast	25 encounters
4/15/2014	Eastport Terrace	8 encounters
4/17/2014	Eastport Terrace	6 encounters
4/23/2014	Obery Court	5 encounters
4/29/2014	Eastport Terrace	5 encounters
5/6/2014	Eastport Terrace	5 encounters
5/13/2014	Eastport Terrace	5 encounters
5/20/2014	Eastport Terrace	5 encounters
5/28/2014	Obery Court	5 encounters
6/3/2014	Eastport Terrace	5 encounters
6/10/2014	Eastport Terrace	5 encounters
6/10/2014	Obery Court	5 encounters
6/17/2014	Eastport Terrace	5 encounters
6/24/2014	Eastport Terrace	5 encounters
6/25/2014	Obery Court	5 encounters

7/1/2014	Eastport Terrace	5 encounters
7/11/2014	Severna Park Community Center	10 encounters
7/15/2014	Eastport Terrace	10 encounters
7/30/2014	Obery Court	5 encounters
8/5/2014	Eastport Terrace	5 encounters
8/8/2014	Severna Park Community Center	10 encounters
8/19/2014	Eastport Terrace	5 encounters
8/26/2014	Eastport Terrace	5 encounters
9/2/2014	Eastport Terrace	5 encounters
9/9/2014	Eastport Terrace	5 encounters
9/16/2014	Eastport Terrace	5 encounters
9/23/2014	Eastport Terrace	5 encounters
10/7/2014	Eastport Terrace	5 encounters
10/14/2014	Eastport Terrace	5 encounters
10/15/2014	Obery Court	5 encounters
10/29/2014	Rockwell Collins Health Fair	25 encounters
11/5/2014	Severna Park Middle School – AACPS Benefits Fair	25 encounters
11/8/2014	Annapolis High School – AACPS Benefits Fair	25 encounters
11/10/2014	AACPS – Board of Education Benefits Fair	25 encounters

AAMC Internal Employer Initiatives

In addition to the wide-ranging and comprehensive outreach efforts in our community, AAMC extends the same disease prevention and early diagnosis to its 4,000 employees. For example,

most recently as part of its initiatives in support of Heart Month 2015, AAMC's employee wellness program, Energize, launched the Heart@Play Pedometer Walking Challenge to encourage physical activity – a vital part of heart health - among employees, volunteers and other members of the AAMC community. Heart@Play runs for four weeks during the month of February from Monday, February 2nd – Sunday, March 1st. Teams of 5 compete for weekly and grand prizes by recording and entering the number of steps walked each week. Prizes are based on both participation and maximum number of steps per team and each person to register receives a free pedometer to track their daily steps. Energize set an overall walking goal of 60,000 miles during the four weeks of the challenge – the length of the entire human circulatory system with veins, arteries and capillaries laid end to end. Almost 650 AAMC employees, volunteers and community members joined the challenge, and more than 130 teams were formed. During the first week of the challenge along participants walked more than 30 million steps - over 13,100 miles.

askAAMC

AskAAMC is a telephone nurse advice program that is available to the public and staffed (Maryland residents only) 365 days a year from 7am to 1am. Since its inception in 1986, AAMC health resource nurses have managed more than one million calls. The nurses have more than 100 years of tele-health experience. Before becoming health resource nurses, they worked in emergency care, pediatrics, medicine, and surgical hospital units. Nurses work with callers to identify and evaluate symptoms, provide medical information so the caller can make an informed decision, recommend next steps, and, if necessary, make a referral to the doctor or to the wide range of community-based programs that are available through AAMC. The askAAMC nurses routinely receive calls from the community related to questions and symptoms they have. The nurses assist callers with quickly accessing EMS if the caller has symptoms related to an acute heart condition. They also help access assistance for medication questions and other cardiovascular disease management issues. Follow up calls are provided to patients who are discharged from the hospital with cardiovascular disease to ensure they are compliant with medication use and physician follow up.

Nurses were trained by the Cardiac Program Coordinator on Early Heart Attack Care. Included in the presentation were signs and symptoms of a heart attack, including atypical symptoms and the importance of activating EMS for symptoms that last more than a few minutes.

DARE to C.A.R.E Screenings

Dare to C.A.R.E. is a non-profit organization supported by AAMC. Screenings are available in four locations and are offered to the community at various on-site locations throughout the year.

Since June 2000, over 52,000 individuals have received screenings for cardio-vascular disease. In FY 2013, 4,294 individuals were screened.

In FY 2014, the screenings targeted high risk individuals. Screenings were offered on-site at Morris Blum Senior Housing and Wiley Bates Senior Housing. These locations house the most vulnerable patient populations in Annapolis; the residents are African American seniors with limited access to healthcare. Forty-five seniors were screened.

The purpose of the screening is to detect cardiovascular disease that can be managed appropriately through primary care teams. Patients are referred back to their primary care team for further follow up and on-going management. Patients who cannot afford healthcare are referred to AAMC's low-income clinics for primary care.

C. CARDIOVASCULAR DISEASE PREVENTION AND EARLY DIAGNOSIS OUTREACH TO MINORITY AND INDIGENT PATIENTS

Although AAMC is located in the affluent city of Annapolis, there is a prevalence of preventable heart disease within pockets of the underserved and minority communities that surround the city. In fact, living among great wealth is significant poverty and poor health. The focus of AAMC's Community Health and Wellness Department is to improve the health of the communities we serve, targeting the underserved, minority, and at-risk individuals for poor health.

In Anne Arundel County, the age adjusted mortality rate related to heart disease is 191.6 per 100,000 population. For African Americans, the mortality rate is higher at 215.2 per 100,000. Disparities in risk factors for heart disease are also significant, particularly for hypertension (high blood pressure) and diabetes control. According to the American Heart Association, there is a strong correlation between heart disease and diabetes, with at least 65% of people with diabetes dying from some form of heart disease or stroke. There are also attributable risk factors for heart disease and diabetes including hypertension, high cholesterol, obesity, lack of physical activity, and smoking.

Nearly 68 percent of county residents are overweight or obese and 23 percent of adults smoke (33 percent of African Americans smoke). The rapid growth in the percentage of individuals with diabetes is alarming as well. The incidence rate for diagnosed diabetes for the County is 9.1 per 1,000 population,¹⁸ which is above the rate of 8.9 per 1,000 population in Maryland. In Anne Arundel County, the rate of emergency room visits for diabetes was 280.3 ER visits per 100,000 population, and for African Americans it was 688.5 ER visits per 100,000 population; this is compared with Maryland's rate for African Americans of 593.3 ER visits per 100,000

¹⁸ <http://www.cdc.gov/diabetes/atlas/countydata/atlas.html> 2010 age-adjusted data adults 18+ yrs.

population. Therefore, the communities that AAMC serves not only have higher mortality and comorbidity rates for heart disease and related risk factors, but the rates are also very disparate for African Americans.

Community Partnerships for High Risk Individuals

AAMC collaborates with numerous for-profit, non-profit and government agencies to provide heart health programs in to the community.

Partners in Anne Arundel County include:

American Cancer Society

American Heart Association

Annapolis Gardens/ Bay Ridge Gardens Housing

Anne Arundel Community College

Anne Arundel County Department of Aging

Anne Arundel County Department of Health

Anne Arundel County Department of Parks and Recreation

Anne Arundel County Department of Social Services

Anne Arundel County Public Schools

Anne Arundel County Fire and Police Departments

Anne Arundel County Mental Health Agency

ARINC

Arthritis Foundation

Arundel Lodge

Asbury United Methodist Church

Asbury Broadneck United Methodist Church

Boys & Girls Club of Anne Arundel County

Centro de Ayuda (Center of Hope)

City of Annapolis

City of Annapolis Parks & Recreation

Community Action Partnership

Delta Sigma Theta

Emergency Medical Services (city of Annapolis and County)

First Baptist Church

First Christian Church

Ginger Cove Retirement Community

Grace Points Church of the Nazarene

Heritage Church/ Hispanic Outreach Ministry

Heritage Harbour Life Care Retirement Community

Housing Authority of the City of Annapolis

Kris Leigh Assisted Living

Lighthouse Shelter

The Links

Lyons Club

Mt Olive AME Church

National Coalition of 100 Black Women

Northrup Grumman Corporation

Obery Court/ Timothy Glenn/ Pennrose Management Co – Low Income Housing

Severna Park Community Center

Sollers United Methodist Church

Sunrise Senior Living

St. Matthews AME

Wiley Bates Senior Housing

US Naval Academy.

Westfield Annapolis Mall

Partners in surrounding counties include:

Bowie Baysox (Prince George's County)

Bowie High School (Prince George's County)

Bowie Senior Center (Prince George's County)

Calvert County Library

City of Bowie (Prince George's County)

Cornerstone Church (Prince George's County)

First Baptist of Glen Arden (Prince George's County)

Greater Mt. Nebo Church (Prince George's County)

Huntington Fire Station (Calvert County)

Kent Island Fire House (Queen Anne's County)

Kent Island High School (Queen Anne's County)

Queen Anne's Department of Aging

Waldorf Jaycees (Prince George's County)

AAMC has designed specific outreach programs that will target minority or underserved populations as it addresses community risk factors for heart disease. The programs developed and implemented with community partners are as follows.

The Housing Authority of the City of Annapolis

In 2012, AAMC entered into a formal relationship with the Housing Authority of the City of Annapolis (HACA). HACA owns and operates over 700 low income rental housing units. The units span seven neighborhoods. Since HACA is public housing, some of the County's most indigent live in these neighborhoods. The partnership between AAMC and HACA addresses unmet healthcare needs and focuses on improving the quality of life for these residents.

In March 2013, nurses initiated a weekly community nurse clinic at Morris Blum Senior Housing. Through the clinic, residents of the building were able to access free appointments with on-site nurses for blood pressure screenings and for answers to general health questions and concerns. Over 380 encounters were made with 90 different residents during the 4th quarter of FY 2013. Due to the community need and success of the clinic, the weekly nurse clinics phased out, and a primary care clinic opened in October 2013. The new primary care clinic was initiated through the Health Enterprise Zone project. A primary care medical home was built on-site with a trained team to meet the health needs of the residents. This team can manage the risk factors of heart disease for these residents.

The nurse clinics were re-initiated at Eastport Terrace/Harbor House complex in April 2014. The residents, although younger, also have risk factors for heart disease. The nurses have met with nearly 50 residents for 100 encounters during YTD FY 2014.

Healthy Anne Arundel Coalition

In FY 2012, Anne Arundel County formed its Local Health Improvement Coalition, Healthy Anne Arundel. In FY 13, the county released its Community Health Needs Assessment (Exhibit 5(a)) which defined obesity as the number one health problem in the county, and heart disease and diabetes were concurrently listed as the fourth health problem in the county. As a result, Healthy Anne Arundel executed a county wide public health action plan to reduce obesity and heart disease. The plan was designed to develop community-based approaches and work with partners such as HACA, Anne Arundel County Public Schools, and faith-based organizations to further reach into the community. AAMC holds key leadership on the county committees as Vice

Chair of the Healthy Anne Arundel Coalition and Chair of the Obesity Prevention Sub Committee.

The Obesity prevention Sub Committee was designed to (1) expand healthy food options to all county residents, and (2) expand low cost or free exercise programs to all county residents for the purpose of reducing the 66% obesity/overweight statistic. Reducing the rate of obesity is directly linked to reducing heart disease. AAMC remains committed to supporting county-wide efforts through community collaborations.

Faith-Based Outreach

Faith-based organizations play a critical role in reaching out to community members and providing information that will improve the lives of their congregants and communities. As many faith-based leaders connect physical health to spiritual health, they are in a unique position to incorporate important health messages into church activities. The historic ties between the faith-based community and the civil rights movement have also motivated clergy and congregants to advocate for health equity in their communities. AAMC has collaborated with ten African American Churches in the county to develop culturally appropriate and strategic programs for their congregations to reduce heart disease. Specifically, AAMC has trained their health ministries to provide monthly blood pressure screenings and help congregations access primary care providers to modify their risk factors. AAMC has also provided speakers about heart disease to further the education process.

Barber Shops

In the summer of 2014, AAMC partnered with a barber shop in Annapolis to increase awareness about hypertension (high blood pressure) among African American men. During a busy Saturday morning, a nurse completed 15 blood pressure screenings, and half of the men registered as borderline or hypertensive. AAMC connected the men back to their primary care physicians or provided referrals to primary care physicians for on-going follow up.

The feedback from the owner of the barbershop was very positive, and plans to provide quarterly blood pressure clinics are being developed and implanted as this application is being submitted.

Diabetes Self-Management Programs

The Living Well with Diabetes program is a 6 week course based on the evidence-based Stanford program. It is offered in partnership with the Anne Arundel County Department of Aging. Classes are offered on AAMC's campus and throughout the community in places like senior centers, housing units, and libraries. The course is geared towards individuals who have

Type 2 Diabetes and their caregivers. Topics include symptom management, exercise, healthy eating, medication use, and working with the care team. The purpose of the class is to help individuals better manage their diabetes to decrease the risk of other co-morbidities, including heart disease. In FY 2013 and FY 2014, there were 10 workshops held in Anne Arundel County, and 167 individuals participated. Classes are free to the public.

Westfield Mall Walking Club

AAMC is committed to providing access to free exercise programs. In FY 2013, AAMC partnered with Westfield Annapolis Mall to create a free community walking club. To date, more than 500 individuals have registered for the Walking Program. They meet monthly to stay motivated, get their blood pressure checked, obtain health education information, and receive free flu shots during flu season. In FY 2013, AAMC nurses provided 220 free, monthly blood pressure screenings to the mall walkers at Westfield Annapolis Mall. There is a marked walking path in the mall as well as health education signage related to heart health prevention throughout the path. Participants receive a free pedometer and log when they sign up for the walking club to track their steps and miles. The Mall is on one of the County's bus lines and it opens at 7am daily. This allows ease of access to all county residents and provides a safe, climate-controlled environment for year-round exercise.

AAMC will continue to develop relationships with the underserved and minority communities. The work with HACA, the faith-based community, and area barber shops will expand AAMC's reach into those pockets of need. Programs to reduce smoking, improve nutrition and weight loss, and provide education related to heart disease risk factors will continue to be targeted to those most in need. AAMC will leverage partnerships to advance the work in prevention and education of heart disease to reach as many people as possible throughout the communities it serves.

Starting in January 2015, one way AAMC will do this is through an online Heart Health Risk Assessment (HRA). The free HRA tool will allow users to calculate their risk of developing cardiovascular disease and prioritize their most harmful cardiovascular disease risk factors. Users will have the opportunity to print or email their report to easily share results with their doctors. Through this tool, AAMC will also have the opportunity to follow up with those who are most at risk for heart disease to provide next steps and additional resources to help improve their health. For those with lower risk factors, AAMC can provide information about health and wellness classes to encourage continued heart healthy behaviors.

Additional health education classes on topics such as kidney disease and heart disease are also being developed so patients can gain a better understanding of their disease and how to manage

it. Increased knowledge can lead to better compliance related to medication use and following dietary and exercise guidelines. Programs will be free of charge and available to the community.

D. RESEARCH AND TRAINING

Johns Hopkins Research Initiatives

In 2006, the National Institutes of Health (NIH) established the Clinical and Translational Science Award (CTSA) program. CTSA program aims to strengthen and support the spectrum of translational research by accelerating the process of translating laboratory discoveries into treatments for patients, training a new generation of clinical and translational researchers, and engaging communities in clinical research efforts through a nationwide network of research universities. The Johns Hopkins Institute for Clinical and Translational Research (ICTR) was established in 2007 as one of more than 60 medical research institutions working together as a national consortium to improve the way biomedical research is conducted across the country and is the only center in Maryland. Through its affiliation with JHM, patients at AAMC are afforded the opportunity to participate in national translational research studies through the ICTR program. AAMC has been the leading accruer to the ICTR trials of all network sites. Information about the ICTR and ongoing clinical trials can be found at: <http://ictr.johnshopkins.edu/> and at <http://www.hopkinsmedicine.org/Research/centers.html>.

In addition to clinical trial opportunities available through the Johns Hopkins ICTR and the CTSA network, a multitude of opportunities exist through national, regional and local clinical trials ongoing at JHM through the Johns Hopkins Heart and Vascular institute (HVI). The HVI is composed of the Divisions of Cardiac Surgery, Cardiology, Vascular Surgery, Cardiac Anesthesia and Interventional Vascular Radiology. This affiliation will provide the opportunity for AAMC patients to benefit from inclusion in clinical trials in Cardiac Surgery as well as its partners in the HVI. AAMC has been a member of the Johns Hopkins Oncology Clinical Trials Network for nearly a decade, and the administrative framework is currently in place to expand the research into cardiac and vascular diseases. Dedicated research assistants will be available at AAMC to identify potential patients and assist in the enrollment and management of clinical trial patients.

Attached as Exhibit 9(a) is a list of current ongoing clinical trials in which Johns Hopkins Cardiac Surgery, Cardiology and Cardiac Anesthesia faculty are participating and which will be immediately available for AAMC patients after Institutional Review Board (IRB) approval. A comprehensive list of the ongoing clinical trials of Cardiac Surgery and its HVI can be found at the Johns Hopkins Heart and vascular Institute website at http://www.hopkinsmedicine.org/heart_vascular_institute/research. Exhibit 9(b) and 9(d) include a description of ongoing quality initiatives and practice guidelines, respectively.

Johns Hopkins Training Initiatives

One of the unique aspects of the proposed cardiac surgery program at AAMC is the affiliation with the training program in cardiac surgery. The Johns Hopkins Thoracic Surgery Residency program is a fully accredited ACGME (Accreditation Council for Graduate Medical Education) training program (Exhibit 9(c)) in all aspects of cardiac and thoracic surgery which leads to specialty certification by the American Board of Thoracic Surgery (ABTS). The program is a 3 year program with dedicated time in each of the subspecialties that make up Thoracic Surgery, including an elective period of time to spend dedicated time in an area of particular interest. Attached is the Cardiothoracic Surgery Residency Surgery Prospectus which is given to program applicants at the time of their interview and is updated yearly.

Thoracic Surgery Residencies are traditionally centered on university, public and Veterans Administration hospitals. AAMC offers a unique opportunity to enhance the training of JHM residents by conducting a portion of their training in the community hospital environment after appropriate ACGME and ABTS approval. In addition to the unique focus of a community hospital setting, time at AAMC will provide an opportunity for the cardiac surgery residents to work with an additional staff of cardiologists, anesthesiologists, and intensivists whose primary focus is clinical medicine.

The specialty of cardiac surgery is evolving into one with minimally invasive and wire based percutaneous approaches assuming a larger and larger role. The catheterization laboratory and operating rooms are the primary locations for such procedures. The opportunity to participate in these types of cases at university hospitals is limited by cardiology and vascular surgery trainees also seeking such exposure. At AAMC, without cardiology and vascular surgery fellows there will not be such competition for cases, and there is a high likelihood for a rewarding educational experience working in the catheterization laboratory and operating rooms in addition to the cardiac surgery operating rooms.

The Johns Hopkins Thoracic Surgery Residency program has a weekly 2 hour didactic lecture series throughout the year based on recommendations of the Thoracic Surgery Directors Association (TSDA), the Thoracic Surgery Residents Association (TSRA), the Joint Council on Thoracic Surgery Education (JCTSE), and the American Board of Thoracic Surgery (ABTS). While residents rotate at AAMC, these lectures will be available to all members of the AAMC Cardiac Surgery team via videoconference using the same videoconferencing system used for the weekly Morbidity Mortality conference. One hour of the weekly lecture series is based on a 2 year cycle of lectures/topics available at <http://www.tsda.org/wp-content/uploads/2014/07/TSC-88-Week-Schedule-and-Topic.13-15.pdf> (Exhibit 9(c)) and included as an appendix to this application.

AAMC Cardiology and Anesthesia staff will be integrated into the weekly lecture series to become fully integrated into the training of the cardiac surgery residents. The residents will also attend, and participate in, the weekly cardiac catheterization conference to enrich their clinical experience by reviewing diagnostic studies and discussing treatment options with the referring cardiologists and attending cardiac surgeons.

AAMC's Research and Training

The Anne Arundel Health System Research Institute is a not-for-profit medical research organization chartered in 2008 under AAMC's parent corporation. It allows qualified investigators from the medical and hospital staff to conduct clinical trials and investigator-initiated studies with the support of its clinical research professionals. A major component of AAMC's Center for Healthcare Improvement under the direction of Barry Meisenberg, M.D., Chair for Quality and Health Systems Research, the institute currently has 160 open studies, 8 of which involve cardiology or vascular surgery.

Proposed research protocols are reviewed through the AAMC Clinical Research Committee for scientific merit and appropriateness for the medical center, then by the Western-Copernicus Institutional Review Board. The Research Institute and hospital staff work together to meet protocol requirements while ensuring the quality and safety of patient care.

AAMC's extensive research includes pharmaceutical and device trials in multiple specialties including Medicine, Cardiology, Vascular Surgery, Oncology, Minimally Invasive Surgery, Orthopedics, and Nursing. In addition to conducting NIH and commercial trials, many investigators develop their own protocols in their specialties. The Institute's Research Nurses and Clinical Trials Coordinators provide professional research support. A full-time research pharmacist is employed in AAMC's Infusion Center. Cardiac Cath and Operating Room nurses are experienced in combining clinical care and research protocols.

Among AAMC's many research achievements, participation in the Atlantic CPORT and CPORT-E trials, conducted in our Cardiac Cath Labs under the direction of principle investigator and Interventional Cardiologist Jonathan Altschuler, M.D., contributed research data on large numbers of patients with precise reporting and exacting patient selection and care quality. Current cardiology studies include clinical trials of carotid and peripheral endovascular stents, plus pharmaceutical trials involving anticoagulants, lipid-reducing drugs, and drugs to reduce cardiovascular risk in patients with diabetes.

James and Sylvia Earl SAIL Center (Simulations to Advance Innovation and Learning):

The Earl SAIL Center offers highly realistic simulations for team training, inter-professional training, and development of individual skills through a variety of modalities. This training will enhance the safe care of cardiac surgery patients as it does for those in multiple specialties now. Additionally, the SAIL Center's Innovation Suite allows leading physicians to develop surgical innovations and conduct research that is typically performed at academic centers. The SAIL Center's courses, staff and leadership can assist with the development of the Cardiac Surgery Team and help surgeons find ways to improve techniques and technologies.

AAMC Achievements

Designated Cardiac Intervention Center:

As further evidence of the excellence of AAMC's Interventional Cardiology program, the Maryland Institute of Emergency Medical Services Systems (MIEMSS) has recently renewed for five years AAMC's designation as a Cardiac Intervention Center under COMAR 30.08.02.

The designation as a "Cardiac Interventional Center" indicates that a hospital complies with State standards to receive patients transported by EMS who are experiencing the most common type of heart attack called an ST-elevation myocardial infarction, or "STEMI." As a Cardiac Interventional Center, AAMC is approved by MIEMSS and the EMS Board to receive patients transported by ambulance with a STEMI who are appropriate for Primary Percutaneous Coronary Intervention. EMS providers who have identified a STEMI patient in the field may transport those patients to the closest designated Cardiac Interventional Center, bypassing non-designated hospitals in accordance with the *Maryland Medical Protocols for EMS Providers*. A Cardiac Interventional Center may receive STEMI patients transported by ambulance directly to the catheterization lab when approved by the base station physician. To qualify for this designation, a catheterization lab must have a physician who is appropriately credentialed to evaluate and stabilize an acute cardiac patient, a registered nurse, and a technician capable of activating the catheterization lab, immediately available in house when (1) the 12 lead EKG in the field is interpreted by an advanced life support EMS provider as a high probability of a STEMI or (2) the 12 lead EKG in the field has been reviewed by an ED physician or cardiologist and determined to be a STEMI. AAMC is actively involved in EMS Regions 3, 4, and 5, has representation on the Region 5 quality committee of MIEMSS, and works with the area EMS to support education and quality.

Designated Chest Pain Center Accreditation:

AAMC is dedicated to maintaining and providing high quality programs for the community and the highest standard of care for the patient with Acute Coronary Syndrome (ACS). To become accredited as a Chest Pain Center by the Society of Cardiovascular Patient Care (SCPC), a hospital must demonstrate that its processes and policies promote internal and external community health, wellness and knowledge, and provide high quality cardiac care across the continuum of chest pain, ACS and Acute Myocardial Infarction (AMI) patients.

AAMC has been accredited by the Society of Cardiovascular Patient Care (SCPC) as a Chest Pain Center since 2008. AAMC took further steps to demonstrate the quality of care given to its patients experiencing acute cardiac conditions by achieving Cycle II Certification in 2008 followed by Cycle III Certification with PCI in 2012. Cycle IV accreditation was obtained January 2015 during an extensive site visit. (Exhibit 10(c)). AAMC met and exceeded the SCPC's comprehensive requirements of eight key elements that includes community education of early heart attack care (EHAC) and community outreach to low income and underserved areas, Emergency Department integration with Emergency Medical Services (EMS) in three MIEMSS regions, tracking detailed data on the care of high risk and low risk chest pain patients for process improvement, maintaining detailed peer review and quality review processes, and with full commitment of organizational resources. As a testament to AAMC's high quality chest pain center, the SCPC invited AAMC to present at its 18th Annual Congress in May 2015.

The Cardiac Operations team meets monthly to address internal processes that impact the requirements set forth by the SCPC. The Chest Pain Center Committee meets quarterly. It is an interdisciplinary group with representatives from Emergency and Medical Services that serve AAMC to ensure that the hospital continues to meet the standards of the Chest Pain Accreditation. This committee includes members of the Emergency Department, Cardiology, Interventional Cardiology, Administrators, Nurses and Technicians from every department that is involved in the care of the chest pain patient.

The Chest Pain Center Cardiac Work Group also meets monthly. This work group consists of Senior Director Anne Marie Pessagno, Dr. Jonathan Altschuler, Dr. William Maxted, and Toni Schiller, RN, CCCC, Chest Pain Center Coordinator. The Work Group provides executive level oversight of the Chest Pain Center Committee.

ACC-Action Registry-GWTG:

AAMC also demonstrates achievement by sustaining performance measures in the treatment of heart attack patients through the implementation of ACTION Registry®-GWTG™ and through in-hospital initiation of the American College of Cardiology/American Heart Association

Clinical Guideline recommendations. AAMC has been a recipient of the Silver Performance Achievement Award 2010, the Gold Performance Achievement Award 2012, and the Mission Lifeline Bronze Recognition of Achievement for STEMI Care 2013.

Delmarva Foundation Excellence Award for Quality:

AAMC has received the 2014 Delmarva Foundation Excellence Award for Quality Improvement for the second year in a row. This excellence award directly reflects the quality of care delivered to patients as AAMC continues to set higher standards for delivering expert care.

Delmarva Foundation, Medicare's Quality Improvement Organization (QIO) for Maryland, developed the requirements for the 2014 Excellence Award for Quality Improvement. The purpose of the award is to recognize individual hospitals that excel in patient safety and quality improvement in four inpatient clinical areas of national focus – Heart Failure, Surgical Care Improvement, Pneumonia, and Immunization.

2014 Criteria

- Individual performance for each measure rate must be $\geq 90\%$ for all 4 quarters on the 10 required inpatient measures in order to be considered for the award.
- Hospitals with an annual aggregate performance measurement rate $\geq 96\%$ will be awarded the *Delmarva Foundation Excellence Award for Quality Improvement*.

This award recognizes the high standards for quality of care and patient safety established and maintained by AAMC, both for the clinical services noted and for the hospital's rigorous quality improvement program.

Magnet Recognition Program for Nursing Excellence:

AAMC achieved American Nurses Credentialing Center (ANCC) Magnet® recognition on September 15, 2014, as a reflection of its patient- and family-centered care, nursing professionalism and teamwork. AAMC Nursing has consistently used this Magnet framework to improve care, quality and outcomes for patients, while also improving patient satisfaction and the work environment. Designation is the result of passing a rigorous process of application, documentation submission and site visit by ANCC appraisers. Throughout this process AAMC consistently demonstrated nursing excellence across the organization to deliver superior patient care with a focus on quality of nursing leadership, coordination and collaboration across specialties, as well as processes for measuring and improving the quality and delivery of care.

Magnet recognition is determined by the ANCC's Magnet Recognition Program®, which ensures that standards for nursing excellence are met. The Magnet model is designed to provide a framework for nursing practice, research, and measurement of outcomes. The term “Magnet” refers to hospital work environments that attract and retain well-qualified nurses who promote quality patient care. Magnet recognition has been shown to provide specific benefits to hospitals and their communities, such as higher patient satisfaction, lower mortality and complication rates, higher job satisfaction among nurses, and lower nurse turnover with fewer vacancies.

The ANCC cited five best practices from AAMC:

1. Nursing Leadership
2. Nursing satisfaction results, especially nurse-physician collaboration
3. Patient satisfaction results
4. Implementation and dissemination of evidenced-based practice across the organization
5. Patient- and family-centered care, especially its use of patient and family advisors

With this credential, AAMC joins the Magnet Community – a select group of 401 U.S. hospitals out of some 5,700 organizations recognized for delivering the highest quality of care to patients and families.

10.24.01.08G(3)(b) - Need

For purposes of evaluating an application under this subsection, the Commission shall consider the applicable need analysis in the State Health Plan. If no State Health Plan need analysis is applicable, the Commission shall consider whether the applicant has demonstrated unmet needs of the population to be served, and established that the proposed project meets those needs.

Please discuss the need of the population served or to be served by the project.

Responses should include a quantitative analysis that, at a minimum, describes the project's expected service area, population size, characteristics, and projected growth. For applications proposing to address the need of special population groups identified in this criterion, please specifically identify those populations that are underserved and describe how this project will address their needs.

Complete Table F for the Entire Facility, including the proposed project, and Table I for the proposed project. Please indicate on the Table if the reporting period is Calendar Year (CY) or Fiscal Year (FY).

APPLICANT RESPONSE

Please see the response to COMAR 10.24.17.05(6), above, for the applicable quantitative need analysis for Cardiac Surgery.

The project would address an unmet need by responding to the need for a more affordable, local, and integrated cardiac care program for residents of Anne Arundel County and AAMC's broader service area. The need for a new cardiac surgery program is based on several factors: (1) the criticality of the service when a patient requires it; (2) current access to the service, including timeliness of access; and (3) impact on quality standards if the service is not made available.

- (1) Cardiac surgery is a critical component in the continuum of care for heart disease and is often life-saving for patients with advanced cardiac pathology. Coronary artery bypass grafting (CABG) is the standard of care when medical or interventional management of coronary artery disease has failed or is impractical. Valve replacement surgery is

essential for patients suffering from valvular stenosis or insufficiency. A range of surgical procedures is necessary for less-frequent but life-threatening conditions.

While this premise is not in doubt, it is important to establish that cardiac surgery is, in fact, a service that extends and saves lives and that there are no good alternatives when it is indicated. When the term “elective” is used in connection with cardiac surgery, it must be understood to mean “non-emergent” and not “one option among several equivalent alternatives.”

- (2) Cardiac disease severe enough to require surgery is progressive. It carries the risk of acute decompensation and potentially irreversible damage. The probability of a good surgical outcome is improved if surgery is employed before that occurs and the patient’s myocardium and overall condition have not been badly compromised.

Access is ultimately a matter of timely availability of the service to the patient when it is needed. Distance is one of several factors that may cause delayed access when patients must be transferred. When a patient has to be evaluated, stabilized, and given the time to arrive at a decision on treatment at one facility and then must wait while arrangements are made for transfer and transport, and spend time in transit, only to repeat much of the process at a second facility, delay is inevitable and often significant. Compounding the problem, hospitals are not required to accept patients for whom transfer is requested, and some will not accept self-pay patients or non-network insurance policies, resulting in further delays. Not every delay causes harm, but some delays do impact health status, and all delays add risks.

- (3) Quality of care means providing appropriate, timely diagnosis and therapy in a safe manner. That includes expert, skilled professional care and systematic elimination of unnecessary risks. Clearly, delayed access in itself has a negative impact on quality as noted above. In addition, interference with care team communication occurs when patients must pass through several transitions of personnel as they are processed through a transfer. Hand-offs have long been known to increase the risk of medical errors.

A percentage of cardiac surgical patients inevitably suffer post-operative complications after returning home. When definitive treatment is only available at the distant hospital where the operation was performed, patients may return there on their own or seek help in a nearer emergency department, from which they may have to be transferred yet again. Either option results in delay and risk resulting from the lack of reasonable access to cardiac surgery.

Evidence of the impact of reduced access to cardiac surgery for AAMC's population and the resulting need is shown under **Certificate of Need Standards, Section (5): Access.**

Tables F and I are attached within the Table Appendix.

10.24.01.08G(3)(c) – Availability of More Cost Effective Alternatives

For purposes of evaluating an application under this subsection, the Commission shall compare the cost effectiveness of providing the proposed service through the proposed project with the cost effectiveness of providing the service at alternative existing facilities, or alternative facilities which have submitted a competitive application as part of a comparative review.

Please explain the characteristics of the project which demonstrate why it is a less costly or a more effective alternative for meeting the needs identified.

For applications proposing to demonstrate superior patient care effectiveness, please describe the characteristics of the project which will assure the quality of care to be provided. These may include, but are not limited to: meeting accreditation standards, personnel qualifications of caregivers, special relationships with public agencies for patient care services affected by the project, the development of community-based services or other characteristics that the Commission should take into account.

APPLICANT RESPONSE

AAMC is the most cost effective alternative for cardiac surgery services of the hospitals currently providing those services for patient in our service area.

AAMC projects that most of its cardiac surgery caseload will represent cases redirected from three hospitals: JHH, the University of Maryland Medical Center (UMMC), and the Washington Hospital Center (WHC).

Cardiac Surgery Programs

Chart 41 lists the cardiac surgery programs in Maryland and Washington, DC, with key statistics for each cardiac surgery hospital and statistics for the proposed program at AAMC. The payment data for the DC hospitals is equal to the payment per case and payment per CMAD of the WHC.

Chart 41
AAMC Cardiac Surgery Program
The Relative Payments per Case and per CMAD
of Selected Cardiac Surgery Programs: FY 2014

Hospital	Relocated Cases	Payment per Case*	Payment per CMAD**	% Above AAMC
Johns Hopkins	69	\$65,174	\$19,052	114%
University of MD	29	\$66,803	\$19,528	119%
Union Memorial	2	\$46,963	\$13,728	54%
UM St Joseph	1	\$36,958	\$10,803	21%
Sinai	3	\$46,187	\$13,501	52%
Washington Adventist	6	\$45,034	\$13,164	48%
DC Hospitals	227	\$58,681	\$17,158	93%
Total Average	337	\$60,224	\$17,605	98%
AAMC		\$35,851	\$10,480	

Sources:

- (1) HSCRC Discharge Abstracts
- (2) MedPAR files and national claims data source

Notes:

* Payment per Case for Maryland Hospitals derived by taking the Charge per case times the estimated average payer differential of 4.4%.

** Payment per CMAD is derived by dividing the Payment per case for each hospital by the average projected case mix for cardiac cases.

The column entitled “Payment per CMAD” represents the relative payments per cardiac surgery case at each of the cardiac surgery hospitals and at the proposed AAMC program.

Since the AAMC program demonstrates to be the lowest relative payments per CMAD (\$10,480) of any of the cardiac surgery hospitals and a much lower payment per CMAD than any of the hospitals from which most cardiac surgery cases will be relocated (JHH, UMMS, WHC), it is the least costly alternative for current patients requiring cardiac surgery services.

In addition to the demonstrated lowest cost to patients for the relocated cases above, AAMC has demonstrated throughout this application the significant improvement in closer access, coordinated episode of care, and an historical record of enhanced patient care experience.

10.24.01.08G(3)(d) – Viability of Proposal

For purposes of evaluating an application under this subsection, the Commission shall consider the availability of financial and non-financial resources, including community support, necessary to implement the project within the time frame set forth in the Commission's performance requirements, as well as the availability of resources necessary to sustain the project.

Please include in your response:

- (a) Complete applicable Revenues & Expenses (Tables G, H, J and K as applicable), and the Work Force information (Table L) worksheets in the CON Table Package, as required. Instructions are provided in the cover sheet of the CON package. Explain how these tables demonstrate that the proposed project is sustainable and provide a description of the sources and methods for recruitment of needed staff resources for the proposed project, if applicable.**
- (b) Describe and document relevant community support for the proposed project.**
- (c) Identify the performance requirements applicable to the proposed project and explain how the applicant will be able to implement the project in compliance with those performance requirements. Explain the process for completing the project design, contracting and obtaining and obligating the funds within the prescribed time frame. Describe the construction process or refer to a description elsewhere in the application that demonstrates that the project can be completed within the applicable time frame.**
- (d) Audited financial statements for the past two years should be provided by all applicant entities and parent companies.**

APPLICANT RESPONSE

(a) Revenues and Expenses

(i) TABLES

Tables G, H, J, K, and L are attached under “Tables”.

(ii) Sustainability of the Project

As presented in Tables G, H, J, K and L, as well as explained in the financial feasibility section of this CON application, the proposed cardiac surgery program at AAMC does generate a modest operating margin after the second year of operation, assuming that AAMC's GBR

agreement is adjusted for the projected incremental revenue at 85% variable cost factor for the first three years of operation. The new program will contribute to the projected positive operating margin of the existing organization at that time and thus it is anticipated that the new program will be sustainable given the reasonable volume and expense assumptions for the program.

(iii) Recruitment and Manpower

AAMC's manpower needs and recruitment strategies are detailed below by job category.

Cardiac Surgeons

The cardiac surgeons at AAMC will be full time faculty members of the Johns Hopkins University School of Medicine. A total of 3 surgeons (2.5 FTE) will comprise the physician component of the cardiac surgery team. There will be two surgeons, the Chief of Cardiac Surgery and the Associate Chief of Cardiac Surgery, who will be based at AAMC; these 2 surgeons will be on site every day to evaluate patients for surgery, perform surgery, and direct the care of the post-operative patients. There will be, at all times, at least one cardiac surgeon on call. The third cardiac surgeon will be present at AAMC 1-2 days per week and will participate in on-call activities at night during the week and on weekends.

Chief of Cardiac Surgery

This position will be filled by an experienced cardiac surgeon at the associate professor or professor rank with a documented history of clinical excellence, organizational skills, program building and academic accomplishment. This individual will be Board certified by the American Board of Thoracic Surgery and will be jointly appointed by the leadership of JHM and AAMC. This individual will have overall oversight of all aspects of the AAMC cardiac surgery program with direct lines of reporting to the Division of Cardiac Surgery and the Departments of Surgery at JHH and AAMC. The job description for this position is detailed in Exhibit 8(a) (Chief of Cardiac Surgery).

Associate Chief of Cardiac Surgery

This position will be filled by an experienced cardiac surgeon at the assistant or associate professor level. This person will have a proven track record of clinical excellence and will work with the AAMC Chief of Cardiac Surgery to fulfill the multiple missions of the AAMC program. This individual will be Board certified by the American Board of Thoracic Surgery and will be jointly appointed by the Chief of Cardiac Surgery of JHM and the Chief of Cardiac Surgery of AAMC. This surgeon will spend 80-90% of his clinical time at AAMC and will have block time

every other week at JHU to maintain programmatic continuity. The job description for this position is detailed in Exhibit 8(b) (Associate Chief of Cardiac Surgery).

Attending Cardiac Surgeon

This position will be filled by an experienced cardiac surgeon at the assistant or associate professor level. This person will have a proven track record of clinical excellence and will work with the AAMC Chief of Cardiac Surgery to fulfill the multiple missions of the AAMC program. This individual will be Board certified by the American Board of Thoracic Surgery and will be jointly appointed by the Chief of Cardiac Surgery of JHM and the Chief of Cardiac Surgery of AAMC. This surgeon will spend 20% of his clinical time at AAMC and will spend 80% of his clinical time at JHU. The job description for this position is detailed in Exhibit 8(c) (Attending Cardiac Surgeon).

Cardiac Surgery Physician Assistants

Physician assistants (PA) will fill a multidimensional role in the cardiac surgery program at AAMC. They will be involved in all aspects of care of the cardiac surgery patients from patient evaluation to intra-operative assistance to caring for the post-operative patients in the Intensive care unit, the step down unit and in the outpatient clinic. These individuals will be graduates of accredited Physician Assistant Programs, will have appropriate experience, or be trainable, in cardiac surgery, and will be licensed in the State of Maryland. They will be directly answerable to the Head Physician Assistant at AAMC, the Cardiac Surgery Head PA at AAMC, the Head Cardiac Surgery PA at JHU, and the AAMC Chief of Cardiac Surgery.

Head Cardiac Surgery Physician Assistant

This individual will have extensive experience as a cardiac surgery PA and will possess an established track record of leadership, organizational skills, educational skills, and possess superior technical surgical skills. This individual should possess experience in all phases of the evaluation and care of cardiac surgery patients. This individual will be responsible for supervising all health care practitioners referred to as "mid-level practitioners," including Physician Assistants and Nurse Practitioners. This individual will be directly answerable to the Head Physician Assistant at AAMC, the Head Cardiac Surgery PA at JHU, and the Chief of Cardiac Surgery at AAMC. This individual will be based at AAMC and will spend 80-90% of his clinical time at AAMC. He will spend 1 -2 days a month at JHU to help maintain consistency in clinical practice between the programs at AAMC and JHU. The job description for this position is detailed in Exhibit 8(d) (Head Cardiac Surgery Physician Assistant).

Perfusionists

Perfusionists will fulfill a multidimensional role in the cardiac surgery program at AAMC based on the similar role performed at JHU. The perfusionists will be full time JHU employees who are assigned to AAMC. The job description for the Chief Perfusionist is detailed in Exhibit 8(e).

(b) Community Support

Since its founding a century ago, AAMC has met and continually adapted to the community's health needs as a fundamental part of its mission. AAMC's board and management evaluate all service lines in reference to this commitment, using the Community Health Needs Assessment as a guide. In that regard, AAMC now applies for a cardiac surgery program because of the long growing – and now pressing – need in the community. Over the course of two decades, AAMC has grown the cardiovascular program such that AAMC treats hundreds of cardiac patients per year, transferring more than 200 patients annually to other hospitals.

With a growing 65+ population, the need for a cardiac surgery program at AAMC never has been greater, and thus community support never has been stronger. In this CON application, there are dozens of letters from patients who were transferred to other hospitals asking why their care was interrupted at such a frightening time (See Appendix III - Community Support Letters). There are letters from physicians citing delays in transfers, poor patient outcomes, and even the loss of life. Support comes not just from Anne Arundel County, but also the Eastern Shore and neighboring Prince George's County. Leading elected officials ask why AAMC does not have a cardiac surgery program because their constituents are asking them. These include executives, like the Mayor of Annapolis and the Anne Arundel County Executive, as well as a cross-section of legislative leaders from both Anne Arundel County and the Eastern Shore.

Through the AAMC Foundation, business and professional leaders are voicing their support as well. Many believe so strongly that AAMC should have a cardiac program that they have pledged a minimum of \$5 million once the CON is approved, more than is initially needed to launch the program given AAMC's existing facilities. The Foundation already has raised more than \$1 million to support existing cardiac services.

This application also expresses strong support from the payer community. More specifically, one leading payer endorses this new program based on its capacity to provide increased access, a reduction in per capita costs, and the creation of a "high value cardiac service" with JHM.

Diverse communities are adding their support as well. Several of the area's largest African American churches and Hispanic organizations are urging AAMC to make this program a reality.

Given the fervor of community support, and its mission of “responding to the community’s health needs,” not only does it make sense for AAMC to seek this program, it would be irresponsible not to do so.

(c)Implementation

Performance Standards and Construction Timelines

PROJECT IMPLEMENTATION TARGET DATES

CON Application & Process Timeline

File LOI	Dec 2014
File CON	Feb 2015
MHCC Completeness Questions	Feb - Mar 2015
CON Docketed	April 2015
CON Reviewed	April - Oct 2015
CON Decision	Oct 2015

Constructability Timeline

Design Development	June 2015
Construction Drawings/Permitting	Aug 2015
Obligate 51% of Construction Costs	Dec 2015
Construction - Renovation Start	Jan 2016
Construction - Renovation Finish	May 2016
First Use	July 2016
Full Utilization	July 2018

(d) Audited Financial Statements

AAMC's audited financial statements for 2012-2013 and 2013-2014 are attached as Exhibit 6.

10.24.01.08G(3)(e) – Compliance with Conditions of Previous Certificates of Need

To meet this subsection, an applicant shall demonstrate compliance with all conditions applied to previous Certificates of Need granted to the applicant.

APPLICANT RESPONSE

AAMC has been issued the following CONs since 1992 and has complied with all conditions:

1. Level III + NICU - Docket No. 97-02-1988
2. 1998 CON Exemption to relocate old hospital to Jennifer Rd.
3. New 9-Story Addition South Tower - Docket No. 04-02-2153
4. 6th Floor South Tower 30 MSGA Bed - Docket No. 10-02-2308
5. 3rd Floor South Tower 30 MSGA Bed - Docket No. 12-02-2388¹⁹

¹⁹ This project is still ongoing and is obligated to have full licensure by June 2017 (see Exhibit 13).

10.24.01.08G(3)(f) – Impact on Existing Providers

For evaluation under this subsection, an applicant shall provide information and analysis with respect to the impact of the proposed project on existing health care providers in the service area, including the impact on geographic and demographic access to services, on occupancy when there is a risk that this will increase costs to the health care delivery system, and on costs and charges of other providers.

APPLICANT RESPONSE

(a) Impact on Access and Occupancy

The project will impact few hospitals, and this impact will not have a substantial adverse effect on access or occupancy with respect to those hospitals.²⁰

In 2018, the AAMC cardiac surgery program will be fully operational, providing cardiac surgery services to 337 discharges. It is anticipated that these cases will be drawn from hospitals with cardiac surgery programs operating in both Maryland and Washington, DC, as set forth below. Chart 42 depicts the projected number of relocated cardiac surgery cases with the majority of those cases coming from three hospitals – JHH, University of Maryland Medical System and WHC. We have termed these three hospitals the “Competing Hospitals.”

Chart 42
The AAMC Cardiac Surgery Program
Projected Cases Relocated from other Hospitals
FY-2018

Hospital	Total	Medicare	Non-Medicare
Johns Hopkins	69	36	33
University of MD	29	16	13
Washington Adventist	6	3	3
Other Maryland	6	1	5
Subtotal- Maryland	110	56	54
Washington Hospital Center	221	111	110
George Washington University Hospital	6	5	1
Subtotal- DC	227	116	111
Total	337	172	165

²⁰ The impact of the project on the three hospitals discussed in this response (JHH, UMMC, and WHC) is outlined here for the sake of completeness. However, please note that none of these hospitals is located in AAMC’s defined service area and therefore this standard is not applicable to the project’s impact on them.

The financial impact of the AAMC program on each of the competing hospitals will depend primarily on two factors:

- The location of the Competing Hospital (*i.e.*, Maryland or DC)
- The number of cases that will be relocated from the particular Competing Hospital to the AAMC program

The Effect of Location – Impact on Maryland Hospitals

In Maryland, hospitals are subject to the Maryland All-Payer Model Agreement (the “Demonstration”), an Agreement between the Office of the Governor of Maryland, the Center for Medicare and Medicaid Services, the Health Services Cost Review Commission (HSCRC), and the Maryland Department of Health and Mental Hygiene.

In order to implement the Demonstration in accordance with its terms and conditions, the HSCRC has placed most Maryland hospitals on a payment arrangement involving hospital specific target budgets. These target budgets are increased annually by an inflation factor that accounts for the impact of general inflation in the economy on the costs of goods and services used by hospitals to provide patient care. The target budgets are also increased annually by demographic adjustments that account for the projected impact on hospital service levels of demographic changes in the patient service area of the hospitals.

In the case of a hospital that receives CON approval for a new service, it is anticipated that the market for the new service will shift, with patients relocating from other Maryland hospitals to the hospital with the CON program. While the HSCRC does not have fully established policies to adjust a hospital’s target budget for a CON program or to reduce the target budgets of a hospital which has patients redirected to the CON, it is likely that the reductions will take the form of market share adjustments (MSAs). These MSAs are intended to reduce the hospital’s target budget by 50% of the charges that the hospital would have made to its relocated patients treated by the CON program.

For example, if the relocated patients of a hospital represented \$1,000,000 in hospital charges, the adjustment to the hospital’s target budget relative to the CON would be \$500,000, representing 50% of the \$1,000,000 in foregone charges. The remaining \$500,000 not included in the reduction to the target budget is maintained by the hospital to cover the fixed costs of the services that were relocated by the CON.

While the fixed costs of a particular hospital service will vary from one service to the next and will also vary between hospitals (especially between small hospitals, such as Critical Access Hospitals (CAHs), and large hospitals, such as AMCs), the use of a 50% multiplier in the MSA

is intended to leave whole the hospital which experiences relocated cases to a CON or which loses market share for other reasons. The key point is that the 50% of foregone charges that remains with the hospital is intended to provide payments that cover the fixed costs of the hospital's relocated service. This means that the HSCRC policy is designed so that there will be no adverse financial impact on a Maryland hospital as a result of the hospital losing patients to AAMC's cardiac surgery program. Therefore, the cardiac surgery hospitals operating in Maryland would be expected to have no reduction in their net income from services as a result of the relocation of their cardiac surgery cases to AAMC. (This, of course, assumes that the affected cardiac surgery hospitals will manage the costs of their cardiac surgery service appropriately.)

The Effect of Location – Impact on Washington, DC

In Washington, DC, each cardiac surgery hospital is paid for Medicare cases in accordance with the Medicare IPPS and, for most of the hospital's other cardiac surgery cases, on a comparable per case basis using DRGs. Unlike the HSCRC system, the hospital payment arrangements in Washington, DC do not include market share adjustments that would increase the hospital's rates fractionally based on the relocation of cardiac surgery cases to the AAMC cardiac surgery program. This means that the WHC would be expected to lose all of the revenue associated with the 221 relocated cardiac surgery cases while reducing its costs by only the variable costs of the relocated cases.

Impact on Occupancy

The impact on occupancy on the Competing Hospitals for the relocation of cardiac surgery cases represents a very small proportion of each hospital's total volume of service. The calculated volume impact affecting occupancy will be presented in the following section along with the minimal net financial impact.

(b) Probable Impact on Costs and Charges for Similar Services at Other Facilities

As previously stated, the project will not have a material impact on costs at other facilities. The project will likely cause the costs per Equivalent Case Mix Adjusted Discharge (ECMAD) to increase by one-tenth of one percent (0.1%) at the JHH, by less than one-tenth of one percent at the UMMC (0.84%), and by about one-half of one percent (0.5%) at the WHC.

The projected number of relocated cases from the cardiac surgery hospitals to AAMC (see the response to 10.24.17.05(2)) will only have a meaningful impact on the charges and costs of three cardiac surgery hospitals: JHH (69 cases), the University of Maryland Medical Center (29 cases), and the WHC (221 cases).

The impact of the AAMC cardiac surgery program on the charges and costs of each of the Competing Hospitals varies based on the particular hospital's location (Maryland versus Washington, DC).

Maryland Hospitals

It is anticipated that the relocated cardiac surgery cases of the JHH and the University of Maryland Medical Center will give rise to market share adjustments (MSAs) that will reduce the hospital's GBR target budgets. While the HSCRC's policies for applying and calculating the MSAs are not fully established in the context of CON funding, the discussions and precedents regarding MSAs as of the preparation of the AAMC CON suggest that the MSAs for each of the JHH and the University of Maryland Medical Center will be calculated as 50% of the allowable charges of the relocated cases.

Chart 43
The AAMC Cardiac Surgery Program
The Impact on the Charges and Costs per ECMAD
Johns Hopkins and University of Maryland Hospitals: FY-2018

	JHH	University
(1) Aggregate Charges	\$2,005,533,400	\$1,171,227,500
(2) ECMADs	100,634	57,337
(3) Charges per ECMAD	\$19,929	\$20,427
(4) MSA Calculation		
a) Relocated Cases	69	29
(b) Case mix Index	3.4209	3.4209
(c) Relocated CMADs	237.0	99.2
(d) MSA ((3)x(4)(c)x50%)	\$2,351,622	\$1,013,179
(5) Aggregate Charges with MSA (000's) ((1)-(4)(d))	\$2,003,181	\$1,170,214
(6) ECMADs with MSA Adj ((2)-(4)(c))	100,398	57,238
(7) Adj Charges per ECMAD ((5)/(6))	\$19,952	\$20,444
(8) % Change in Charge/ ECMAD ((7)/(3)-1)	0.001=0.1%	0.00084=0.084%

Sources:

- (1) HSCRC Discharge Abstracts

Using each hospital's charges per case mix adjusted discharge (CMAD) for CY-2013, Chart 43 calculates the projected decrease in each hospital's caseload associated with the relocation of cardiac surgery cases; the MSA of JHH and the UMMC; the adjusted total revenue of each

hospital; each hospital's CMADs reduced by the CMADs of the relocated cardiac surgery cases; and each hospital's charges per CMAD before and after the MSA.

The results on Chart 43 show that JHH charges per ECMAD would be expected to increase by only 0.10% and University's charges per CMAD by 0.084%. Furthermore, since the MSAs are designed to maintain the hospital's net income after the MSA revenue and volume adjustments, the projected changes in each hospital's costs per ECMAD is the same as its projected changes in charges per ECMAD, i.e. 0.10% for JHH and 0.084% for the UMMC.

Furthermore, the insignificant impact of the relocated cardiac surgery cases on the costs and charges of the AMCs reflects the fact that the services of each hospital's relocated cardiac surgery cases represent a very small proportion of each hospital's total volume of service: for Johns Hopkins, this proportion is 0.23% (237/ 100,634) and for the University of Maryland 0.17% (99.2/ 57,337). Occupancy is therefore not significantly impacted.

Washington Hospital Center (WHC)

The Medicare and Medicaid rates at the WHC are set by regulation independently of the relocated cases from the WHC to the AAMC cardiac surgery program. The private payer rates at the WHC are established by reimbursement agreements, usually with a multi-year term. Privately negotiated reimbursement agreements between hospitals and payers result in rates that are primarily determined by the relative level of contracting leverage of the hospital or hospital system, on the one hand, and the payer, on the other. Therefore, the private payment rates at the WHC are not plausibly affected by relocated cases from the WHC to the AAMC program.

The costs of WHC per ECMAD will increase as a result of the relocated cases where the percentage amount of the increase will depend on the proportion of WHC's costs that are fixed. In the previous section, AAMC projected the percentage increases in the costs per ECMAD for the JHH (0.10%) and the UMMC (0.084%) by assuming each hospital had 50% fixed costs and by noting that these percentage increases could be derived from each hospital's market share adjustments (MSAs). Therefore, in this subsection, we estimate the MSA for the WHC and derive the hospital's projected increase in costs per ECMAD in the same manner as was done for the Maryland AMCs.

Chart 44 sets forth the projected increase in the costs per ECMAD of WHC showing the projected increase to only be 0.50%.

Chart 44
The AAMC Cardiac Surgery Program
The Impact on the Costs per ECMAD
WHC FY-2013

(1) Aggregate Charges (000's)	\$3,290,287.0
(2) Estimated Charge per CMAD (\$144,757 / 3.4209)	\$42,315
(3) ECMADs (1)/(2)	77,757
(4) MSA Calculation	
(a) Relocated Cases	221
(b) Case mix Index	3.4209
(c) Relocated CMADs	756.0
(d) MSA ((2)x(4)(c) x50%) (000's)	15,995.1
(5) Aggregate Charges with MSA (000's) (1)-(4(d))	\$3,274,291.9
(6) ECMADs with MSA Adj ((3)- (4(c)))	77,001
(7) Adj Charge per ECMAD ((5)/(6))	\$42,522
(8) % Change in Cost per ECMAD ((7)/ (2) -1)	0.50%

Sources:

- (2) HSCRC Discharge Abstracts

Chart 44 sets forth the projected increase in the costs per ECMAD of the WHC showing the projected increase to be 0.50%.

Chart 44 includes on line 2 the estimated charges per CMAD at the WHC. These estimated charges per CMAD were derived by determining the average WHC charge per case for the AAMC cardiac surgery mix of cases (\$144,757) and by dividing this amount by the AAMC cardiac surgery case mix (3.4209):

$$\$42,315 - \$144,757/3.4209$$

The case mix measures used in the calculation of the CMADs of the MSA are based on APR DRGS and the related weights. However, the WHC claims data does not include the classification of inpatient cases by APR DRG. Therefore, WHCs estimated charge per CMAD (line 2) was developed by Berkeley Research Group (BRG) based on weights assigned to each cardiac surgery case that were consistent with the APR DRG weights.

The remaining calculations on Chart 44 follow the MSA methodology that has previously been applied to JHH and University of Maryland hospitals.

Summary

The AAMC cardiac surgery program will not have a significant impact on the costs or charges per case of JHH, the University of Maryland Medical Center, or the WHC. These results would appear to depend on involved statistics such as ECMADs and related APR DRGs and APR DRG weights. However, the general conclusion that the AAMC cardiac surgery program will not have significant financial impact on the three hospitals is obvious when one considers the proportion of each hospital's total services that are expected to be relocated to AAMC. The highest such proportion is at the WHC, whose 221 cases and 756 CMADs account for 0.97% ($756 / 77,757$) of the hospital's total services (77,757 ECMADs).

Such a small change in a hospital's volume of service cannot result in a significant change in either its charges or costs and, therefore, the general conclusions derived from the applications of the MSAs, first to JHH and the University of Maryland Medical Center and second to the WHC, that the AAMC program will not have a significant impact on the charges or costs of these hospitals is obvious.

CONCLUSION

Anne Arundel Medical Center, Inc. hereby requests that the Maryland Health Care Commission grant a certificate of need for Anne Arundel Medical Center to establish a cardiac surgery program.