Final Report for:

Greater Newark Healthcare Services Evaluation

Presented to:

New Jersey Health Care Facilities Financing Authority

NJHCFFA
NEW JERSEY HEALTH CARE FACILITIES FINANCING AUTHORITY

March 2, 2015

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Section 1 – Introduction

Background and Objectives

The New Jersey Health Care Facilities Financing Authority ("NJHCFFA," or "the Authority") engaged Navigant Consulting, Inc. ("Navigant") in July 2014 to evaluate the current inventory of healthcare services in the Greater Newark area to determine whether there is duplication of services, unused capacity, or an insufficiency of necessary services in this area, and if so, propose recommendations to the Commissioner of the New Jersey Department of Health ("the Department") for consolidation or regionalization of services. This engagement is a logical progression in New Jersey's ongoing effort to ensure the State's supply of hospitals and healthcare services are appropriately configured to respond to community needs for high-quality, affordable, and accessible care and that public funding is spent wisely, to help meet New Jersey's healthcare needs in a sustainable way (i.e., the *New Jersey Commission on Rationalizing Health Care Resources* from 2008 and other studies, including the *NJHCFFA Hudson County Hospital Services Consolidation/Regionalization Report* from 2011). This engagement also falls within the Department's responsibility for development and administration of the State's policy with respect to health planning.

Strategic Context

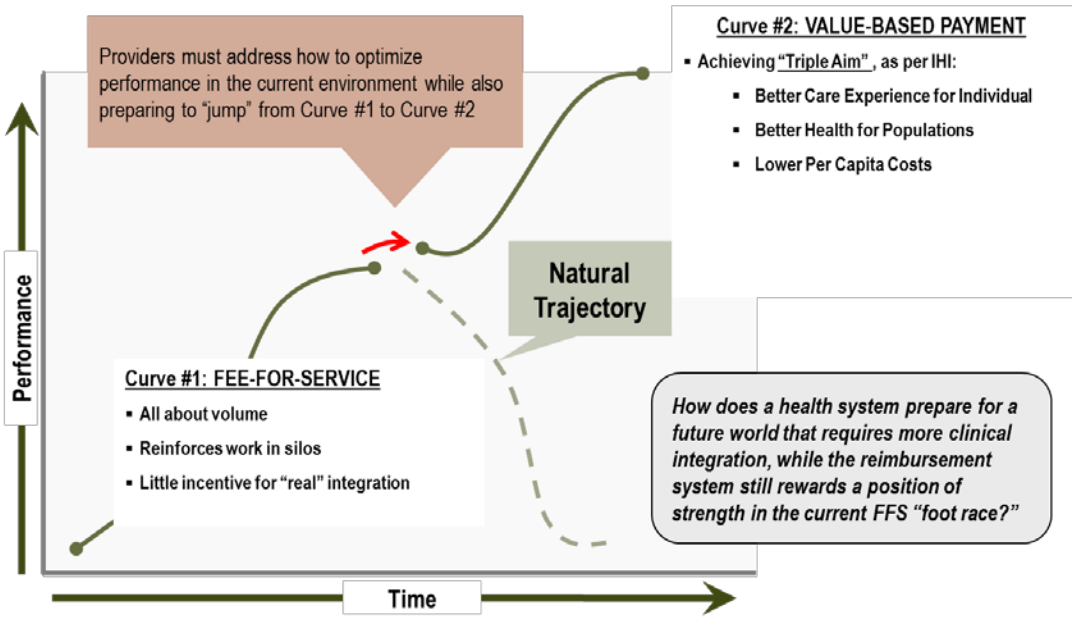
In reading this report and considering the conclusions—and especially the proposed recommendations—it is important to recognize that the healthcare industry in the United States is experiencing a period of profound and unprecedented change. These changes are fundamentally reshaping the industry and reflect a growing consensus among providers, payers, purchasers, physicians, policy makers, and particularly patients—that the current healthcare system is not sustainable and requires not just modest reform but true transformation. As noted by Susan Dentzer, senior policy advisor at the Robert Wood Johnson Foundation, who spoke at the American College of Healthcare Executives' 57th Congress on Healthcare Leadership in March of 2014, the U.S. healthcare industry is a $2.8 trillion industry (the size of the gross domestic product of France), an amount far higher in total and per capita than any other country in the world. Yet life expectancy in the United States is below that of the world's 28 richest countries and 80% of adults are expected to be overweight (if not obese) in six years. And when people get sick, much of the care they receive (up to one half by some estimates) has no evidence to suggest it works. Furthermore, one of the top three causes of death is because of adverse events when patients receive care.

The current transformation of the healthcare system is arguably the most significant in this country since the publication of the Flexner Report more than 100 years ago. The Flexner Report was commissioned by the American Medical Association Council on

Medical Education and conducted under the aegis of the Carnegie Foundation to address unacceptably high levels of variability in the quality of medical school education in the United States. Publication of the report in 1910 and the subsequent adoption of its recommendations to enact higher admission and graduation standards and adhere to the protocols of mainstream science in teaching and research transformed the medical education system (and ultimately the entire healthcare system) by creating a single model of medical education that has largely survived to the present day. Subsequent efforts to reform the healthcare industry in the United States date back to the Truman administration and include every administration since then. However, since the Flexner Report, virtually all of the major reform efforts and changes in healthcare (e.g., the Hill-Burton Act, Medicare, Medicaid, Diagnostic Related Groups ("DRGs"), the Balanced Budget Amendment, the Medicare Prescription Drug Act, the Affordable Care Act) have dealt with how healthcare is financed. The factors driving the current transformation have been building steadily for the last half century and are changing not just how healthcare is financed, but how it is organized and delivered.

In dealing with this transformation of the industry, healthcare organizations must strategically plan to move from the traditional fee-for-service, volume-based reimbursement world to the future fee-for-health, value-based reimbursement environment. This shift, which has become known as the shift from Curve One – Volume-Based Reimbursement to Curve Two – Value-Based Payment, found its way into healthcare in Ian Morrison's 1996 bestseller ***The Second Curve: Radical Strategies for Managing Change***, which posited a theory that after a period of success, organizations hit a plateau as their environment changes. Some organizations are paralyzed by the changes; others chart a new course—their "second curve." The concept of the Curve One to Curve Two shift in healthcare is illustrated in Exhibit 1 below:

EXHIBIT 1-1: THE SHIFT FROM "CURVE ONE" TO "CURVE TWO"



This shift from Curve One to Curve Two is gaining traction, as evidenced by the Department of Health and Human Services' announcement on January 26, 2015 regarding performance goals and timelines for the transition of Medicare payments from volume to value and a public-private partnership to encourage employers, health insurers, physicians and hospitals to adopt similar goals. The primary focus of HHS is expansion of programs that enable Medicare payments to shift from fee for service (FFS) to value via accountable care organizations (Medicare Shared Savings Program), bundled payments (Bundled Payment for Care Improvement Initiative), primary care medical homes, and the value-based purchasing programs included in the Affordable Care Act. In its announcement, HHS noted that 20% of Medicare's $417 million FFS payments in 2014 were made through alternative payment models like these. Medicare's new goal is to increase value-based payment models to 30% by 2016 and 50% by 2018. In addition, it also proposed that by 2016, 85% (vs. 80% today) of all Medicare FFS payments have a component based upon quality or efficiency of care, increasing to 95% by 2018. In a **New England Journal of Medicine** editorial, HHS Secretary Sylvia Burwell wrote: "We are dedicated to using incentives for higher-value care, fostering greater integration and coordination of care and attention to population health, and providing access to information that can enable clinicians and patients to make better-informed choices. We believe that, by working in partnership across the public and private sectors, we can accelerate these improvements and integrate them into the fabric of the U.S. health system."

In order to be successful in the transformed healthcare landscape of the future, healthcare organizations must recognize that their core business is changing: they are increasingly in the "care coordination" (in addition to care delivery) business. Leadership teams and boards must also understand that critical success factors in a "care coordination" paradigm are fundamentally different, as are key performance criteria and measures of success. It is important to note that the recommendations contained in this report are, in many respects, designed with the ongoing transformation of the healthcare industry in mind.

Scope, Work Plan and Data Sources

The Authority's Request for Proposal ("RFP") specified the facilities included in the scope of this project. These facilities include the following:

HOSPITALS	HEALTH CENTERS RECEIVING PUBLIC FUNDING	LONG-TERM CARE FACILITIES
Clara Maass Medical Center ("Clara Maass" or "CMMC")	Jewish Renaissance Medical Center ("JRMC")	Broadway House
East Orange General Hospital ("East Orange" or "EOGH")	Newark Community Health Centers ("NCHC")	
Newark Beth Israel Medical Center ("Newark Beth" or "NBIMC")	Newark Homeless Health Care ("NHHC")	
Saint Michael's Medical Center ("Saint Michael's" or "SMMC")		
University Hospital ("UH")		

In addition, the RFP delineated a series of analyses and assessments the Authority wished to have conducted as part of the scope of this engagement, including:

- Assessing where patients using the specified facilities in the Greater Newark area come from and profiling what services these patients use
- Analyzing where residents of the Greater Newark area go for their healthcare services (including assessing where area residents who leave the Newark area go for care)
- Profiling the physicians serving on the medical staffs of the five hospitals in the study
- Identifying and assessing the presence/relevance/importance of any unique services provided by the hospitals included in the study
- Proposing recommendations to address any duplication or excess capacity or insufficiency of necessary services
- Identifying steps that could be taken to encourage area residents to use area hospitals
- Suggesting methods of support for the missions of University Hospital and the Rutgers-Newark Biomedical and Health Sciences schools
- Assessing the impact on regional health planning solutions in both the short and long term of the potential purchase of an area hospital (or hospitals)
- Addressing the impact of the proposed recommendations on population health in the Greater Newark area
- Assessing the financial impact of the proposed recommendations
- Outlining key steps for implementing the recommendations

To address the scope of work requested by the Authority, we developed a multi-step work plan that included the following activities:

- **Mobilize and Initiate the Project.** The first activity in our work plan entailed organizing and conducting a kickoff meeting with representatives from the Authority and the Department to discuss and clarify the goals and objectives for the project, review our proposed approach, discuss the project work plan and timeline, review the data needed to conduct the project, develop a data collection plan, and agree on a process for obtaining feedback from the Authority and the Department throughout the project.

- **Define the "Planning Area."** A key step in the engagement was to define the relevant study area encompassed in the "Greater Newark area." This area, which we labeled the "Planning Area," was defined based, in large part, on the service areas of each of the hospitals. We reviewed the Planning Area definition with each of the hospitals, as well as with the Authority and the Department to obtain their concurrence.

- **Profile Patient Demographics and Patient Migration Patterns**. Once we defined the Planning Area, we developed a demographic profile of the Planning Area. This profile includes current and projected population by age group, socioeconomic indicators, and health status. In addition, we analyzed patient migration patterns and trends to determine the extent to which residents of the Planning Area utilize healthcare services outside of the Planning Area and to identify the number of patients who come into the Planning Area for services.

- **Assess the Current Inventory of Healthcare Services**. In this task, we identified and profiled the current inventory of healthcare services in the Planning Area, including a determination of which services are unique vs. duplicative (see the following bullet). This inventory includes acute inpatient care services, emergency services, tertiary services, sub-specialty services, ambulatory and outpatient services, publicly funded primary care services, community services, and long-term care services. In addition, we identified and profiled the physicians serving on the medical staffs of the study hospitals, including the physician complement by specialty and age.

- **Identify Unnecessary Duplication of Services and Unused Capacity.** This activity involved comparing current utilization of healthcare services in the Planning Area to current capacity to identify excess capacity. We also evaluated projected demand for healthcare services in the Planning Area, using generally accepted health planning methodologies, and compared this estimate of projected demand to existing and planned capacity to determine the extent to which

duplicative or unused/under-used capacity would exist in the Planning Area in the future.

- **Assess the Physical Plants of the Study Hospitals.** We toured each of the five study hospitals and conducted quantitative and qualitative assessments of their general condition, space adequacy, flows and adjacencies, and capital expenditures required to address regulatory and/or operational efficiency imperatives.

- **Develop Proposed Recommendations and Assess Financial Impact**. Based on the results of the previous activities, we developed a set of recommendations to address unnecessary duplication of services and excess capacity, as well as to enhance the efficiency, financial viability, and quality of services available to residents of the Planning Area. We also prepared a high-level financial impact assessment of the proposed recommendations.

- **Outline Implementation Steps.** Following development of our proposed recommendations, we developed a high-level implementation framework for the recommendations that outlines key steps required to implement the recommendations.

In conducting the analyses associated with this report, we used a wide variety of data sources. In addition to the most recent operational and financial data provided to us by the five study hospitals and other organizations in the study, key data sources include the following:

- American Hospital Association Statistics, 2015 edition
- American Medical Association Physicians Characteristics and Distribution in the United States, 2014 Edition
- Claritas (Demographic Projections and Estimates)
- The Commonwealth Fund (www.whynotthebest.org)
- Community Commons
- Dartmouth Atlas of Health Care (www.dartmouthatlas.org)
- Medical Group Management Association Physician Compensation and Production Survey
- New Jersey Department of Health Facilities Evaluation and Licensing
- The New Jersey Hospital Discharge Data Collection System (NJDDCS, which collects data through Uniform Bill-Patient Summaries)
- New Jersey Medical and Health Sciences Restructuring Act of 2013
- New Jersey Primary Care Association FQHC Directory
- New York Department of Health State Discharge Database
- Newark Agreements of 1968

- Truven Health Care Analytics
- United States Department of Health and Human Services, The Organ Procurement and Transplantation Network

Structure of the Report

The remainder of this document presents the results of our analyses along with our conclusions and recommendations. The report is structured according to our work plan as described above, with the next section addressing the definition of the Planning Area.

Section 2 – Planning Area Definition

This section of our report defines the geographic area encompassed by the "Greater Newark area" referenced in the Authority's RFP. Delineation of this geographic area, which we labeled the "Planning Area," was an essential step in the engagement because the subsequent analyses related to service inventory, unused capacity, duplication of services, patient migration patterns, and patient demographics were based on the delineation of this area. Identification of the relevant geographic market is always the first step in any planning analysis.

Methodology

The Authority's RFP indicated the area encompassed by this study was to include the "Greater Newark area." In order to perform the analyses requested in the RFP, it was necessary to define this area more specifically. As a starting point in defining the "Greater Newark area," we reviewed the self-defined service areas of each of the five hospitals in the study. The hospital service areas were used as a starting point because the areas served by health centers and long-term care facilities, particularly those in densely populated urban areas, tend to be more concentrated and less geographically dispersed than hospital service areas. By using the hospital service areas, we encompassed the geographic areas served by the health centers (Newark locations) and the long-term care facility included in this study. Throughout the analyses in this report, observation cases are excluded from inpatient market share, patient origin, and patient migration data. These cases are, however, included in the calculation and projection of bed need, which is important in estimating facility needs for future scenarios.

Hospital service areas are traditionally defined as the geographic region (typically delineated on a ZIP code level) from which a hospital draws the majority of its patients. This service area is usually subdivided into a "Primary Service Area" ("PSA"), and a "Secondary Service Area" ("SSA"), with the PSA accounting for two-thirds to three-quarters of an organization's total patients, while the SSA contributes an additional 15-20% of an organization's patients. In addition to the patients who live in the PSA and SSA, most hospitals experience a modest level (usually less than 20% of total patient volume) of "in-migration" of patients from outside the PSA and SSA.

Following our review of each hospital's self-defined service area, we reviewed the "Stark Service Area" definition for each hospital. The Stark Service Area is defined as the area "…composed of the lowest number of contiguous ZIP codes from which the facility draws at least 75% of its inpatient discharges." This definition is articulated in the Stark Phase II Regulations issued by the Centers for Medicare and Medicaid ("CMS") in March of 2004

in conjunction with enactment of Section 1877 of the Social Security Act (the Act) (42 U.S.C. 1395nn), also known as the physician self-referral law and commonly referred to as the "Stark Law."

After reviewing each hospital's self-defined service area and Stark Service Area, Navigant identified each hospital's Core Service Area ("CSA"). Our experience has shown that most hospitals—especially community hospitals—have a distinct and relatively compact CSA from which the hospital draws a significant portion of its business (as measured by patient origin) **AND** where the hospital is a major provider of healthcare (as measured by market share).

Based on our review and analysis of the PSAs, SSAs, Stark Service Areas, and CSAs of each of the five hospitals, we defined a single geographic area to serve as the basis for this study (the "Planning Area"). We also compared the Planning Area to both the Newark Hospital Service Area ("HSA") and the Newark Hospital Referral Region ("HRR") as defined by the Dartmouth Atlas. The Dartmouth Atlas analyzes Medicare data to define existing regional and local markets, as well as to provide other information on utilization of health care services. Through an examination of Medicare data, the Dartmouth Atlas defines HSAs and HRRs for every part of the United States, with HSAs being a collection of ZIP codes whose residents receive most of their hospitalizations from the hospitals in that local area and HRRs consisting of regional market areas for tertiary medical services. An HSA is essentially a local healthcare market for hospital care and each HRR contains at least one hospital that performs major cardiovascular and neurosurgery procedures.

The table below summarizes the various approaches to service area definition we considered in establishing the Planning Area.

TABLE 2-1: PLANNING AREA DEFINITION METHODOLOGIES

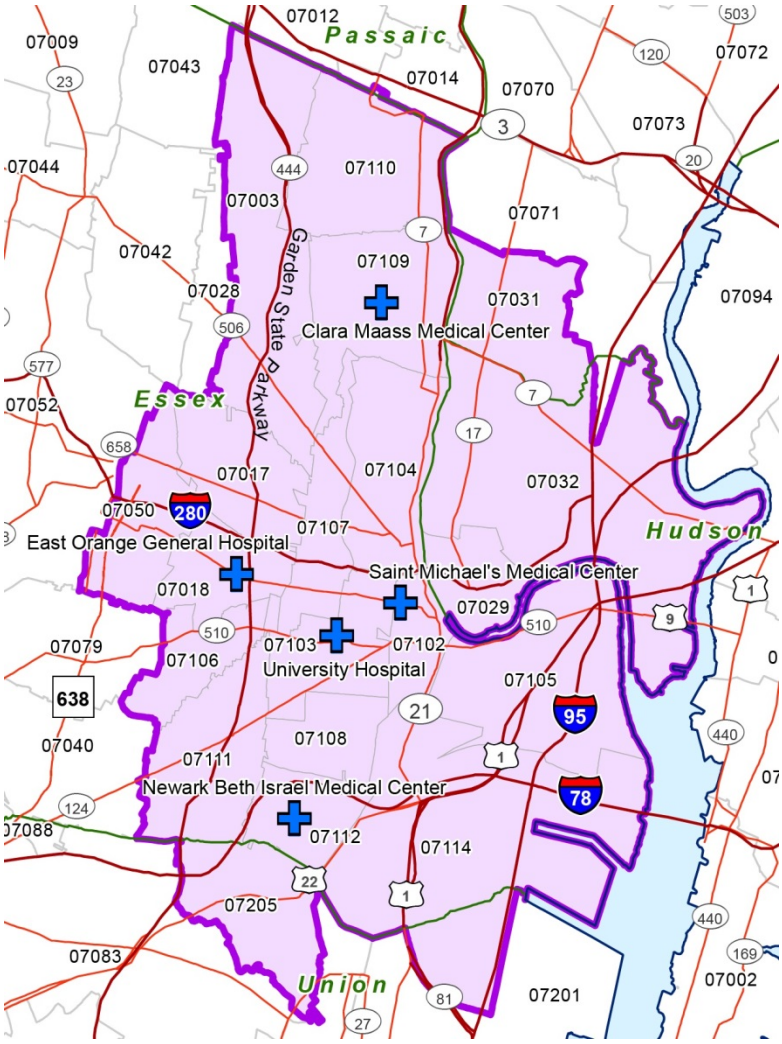
PSA and SSA	Stark SA	Core SA	Planning Area	Dartmouth Atlas HSA	Dartmouth Atlas HRR
Internally defined hospital Primary Service Area (PSA) and Secondary Service Area (SSA)	A hospital's geographic service area that is composed of the lowest number of contiguous zip codes from which the facility draws at least 75% of its inpatient discharges	Navigant-based approach where a service area is determined by identifying the zip codes that are important to the hospital in terms of where its volume comes from (patient origin) and which are reliant on the hospital for their healthcare (market share)	**Combination of Core Service Areas of each hospital to create a single geographic area of focus for the study**	Local healthcare market that is composed of a collection of ZIP codes whose residents receive most of their hospitalizations from the hospitals in that area	Regional market area for tertiary medical care that contains at least one hospital that performs major cardiovascular procedures and neurosurgery

Results

Based on a comparison of the various service area definitions, we defined a Planning Area for this study that includes 20 ZIP codes in the Greater Newark area. Most (16) of these ZIP codes are in Essex County, two are in Hudson County, and there is one each in Bergen and Union Counties. The five study hospitals together account for 68% of the inpatient hospital care provided to Planning Area residents. Furthermore, no other acute medical/surgical hospitals are located in the Planning Area, suggesting that the area accurately represents the region that depends on the five hospitals for healthcare services. In addition, the Planning Area accounts for 78% of these five hospitals' total discharges and, as such, the Planning Area captures more of the hospitals' collective discharges than do any of the separate internally defined PSAs or Stark Service Areas.

The Planning Area used in this study is shown in the map that follows, while Table 2-2 provides Planning Area market volume and market share by ZIP code, and Table 2-3 summarizes the Planning Area information for each of the five study hospitals.

FIGURE 2-1: PLANNING AREA MAP



As the map shows, the Planning Area is bounded roughly on the north by Route 3, the Hackensack River on the east, I-78 on the south, and State Road 638 on the west. It is a densely populated urban area measuring roughly 10 miles by 10 miles and is served by and bisected by a number of major roads and interstates, including I-95, I-78, I-280, the Garden State Parkway, US 1-9, and SR 21.

TABLE 2-2: PLANNING AREA MARKET VOLUME AND MARKET SHARE BY ZIP CODE

FY 2013:	Market Volumes								Market Share					
ZIP	Market	NBIMC	CMMC	EOGH	SMMC	UH	5 Hosp Total	All Other	NBIMC	CMMC	EOGH	SMMC	UH	5 Hosp Total
07003	4,990	174	1,335	63	89	130	1,791	64%	3%	27%	1%	2%	3%	36%
07017	5,575	717	739	1,584	403	527	3,970	29%	13%	13%	28%	7%	9%	71%
07018	4,256	673	207	1,390	247	555	3,072	28%	16%	5%	33%	6%	13%	72%
07029	1,448	69	421	4	276	153	923	36%	5%	29%	0%	19%	11%	64%
07031	1,539	24	558	3	65	20	670	56%	2%	36%	0%	4%	1%	44%
07032	3,710	144	1,376	72	489	178	2,259	39%	4%	37%	2%	13%	5%	61%
07050	4,211	565	204	792	285	490	2,336	45%	13%	5%	19%	7%	12%	55%
07102	1,891	499	93	107	462	376	1,537	19%	26%	5%	6%	24%	20%	81%
07103	4,998	1,159	314	363	588	1,693	4,117	18%	23%	6%	7%	12%	34%	82%
07104	6,974	731	2,705	134	1,190	1,039	5,799	17%	10%	39%	2%	17%	15%	83%
07105	3,800	717	405	154	730	812	2,818	26%	19%	11%	4%	19%	21%	74%
07106	3,679	979	200	327	298	706	2,510	32%	27%	5%	9%	8%	19%	68%
07107	4,980	608	1,644	195	523	1,187	4,157	17%	12%	33%	4%	11%	24%	83%
07108	4,135	1,737	178	139	382	889	3,325	20%	42%	4%	3%	9%	21%	80%
07109	3,804	127	1,881	24	91	135	2,258	41%	3%	49%	1%	2%	4%	59%
07110	2,708	27	896	12	20	31	986	64%	1%	33%	0%	1%	1%	36%
07111	6,569	2,988	243	316	314	773	4,634	29%	45%	4%	5%	5%	12%	71%
07112	3,811	2,212	133	72	225	377	3,019	21%	58%	3%	2%	6%	10%	79%
07114	1,575	520	82	50	213	327	1,192	24%	33%	5%	3%	14%	21%	76%
07205	2,109	522	40	5	35	84	686	67%	25%	2%	0%	2%	4%	33%
Total	**76,762**	**15,192**	**13,654**	**5,806**	**6,925**	**10,482**	**52,059**	**32%**	**20%**	**18%**	**8%**	**9%**	**14%**	**68%**

Source: 2013 New Jersey State Discharge Database; Navigant analysis.
Note: Excludes normal newborns (DRG 795) and observation patients (LOS of 0).

The five study area hospitals recorded a combined total of more than 66,000 discharges in 2013, as noted in the table below. Also, 78% of the total discharges at the five study hospitals originated in the Planning Area, with the three community hospitals (CMMC, EOGH, and SMMC) reporting a higher percentage of their discharges coming from the Planning Area (81%, 91%, and 85%, respectively). NBIMC and UH had a slightly higher percentage of patients coming from outside the Planning Area, reflecting their more specialized service complement and their role as referral and/or major teaching institutions.

TABLE 2-3: PLANNING AREA SUMMARY PROFILE

2013 Data	NBIMC	CMMC	EOGH	SMMC	UH	5 Hosp Total
Discharges from Planning Area	15,192	13,654	5,806	6,925	10,482	**52,059**
Other Discharges from NJ	5,289	3,010	519	1,125	3,651	**13,594**
All Other Discharges*	288	160	48	93	242	**831**
Total Discharges	**20,769**	**16,824**	**6,373**	**8,143**	**14,375**	**66,484**
% from Planning Area	73%	81%	91%	85%	73%	**78.3%**
% from Other New Jersey	26%	18%	8%	14%	25%	**20.5%**
% from All Other	1%	1%	1%	1%	2%	**1.2%**

*All Other includes all discharges from non-New Jersey residents.

Source: 2013 New Jersey State Discharge Database; Navigant analysis.
Note: Excludes normal newborns (DRG 795) and observation patients (LOS of 0).

It should be noted that other than the five study hospitals, the only hospital with significant market share in the Planning Area is Saint Barnabas Medical Center, with 10.8% market share. While Saint Barnabas Medical Center is outside the Planning Area, it is reasonably proximate (approximately 4.5 miles from the western edge of the Planning Area) and likely receives referrals from the two hospitals inside the Planning Area that also are part of Barnabas Health (Clara Maass Medical Center and Newark Beth Israel Medical Center). No other hospital has greater than 4% market share in the Planning Area, which further supports our conclusion that the Planning Area as defined accurately represents the region that depends on the five hospitals for healthcare services.

We conducted a variety of sensitivity analyses to test how robust the Planning Area definition was by adding ZIP codes that are immediately adjacent to the Planning Area and reviewing the subsequent results. Each time we added an adjacent ZIP code to the original 20 ZIP codes, the combined market share of the five study hospitals declined from 68%, suggesting that the residents of the added ZIP code primarily use other hospital

facilities for their healthcare and the five study hospitals were not major providers of service to residents of that ZIP code. We also compared the Planning Area definition to the Dartmouth Atlas HSA and Newark HRR definitions and noted that the Newark HRR includes the entire Planning Area.

Prior to profiling patient demographic characteristics or developing a detailed inventory of services, we reviewed the Planning Area definition with representatives of the Authority and the Department, as well as with executives from each of the five study hospitals. Based on the results of our analyses and these discussions, we concluded that the definition of the Planning Area was appropriate and represented a logical geographic area upon which to base our subsequent analysis. The Appendix contains detailed information on each of the hospital's self-defined service areas, their Stark Service Area definitions, their Core Service Areas, as well as the Dartmouth Atlas HSAs and HRRs.

Section 3—Planning Area Demographic Profile

Once we defined the Planning Area, the next step was to develop a current and future demographic profile of residents of the Planning Area. Gaining a clear understanding of the population, its age distribution and its expected growth is essential to understanding both the future health services needs and the potential impact of any reconfiguration of services. In addition, we profiled the Planning Area's household income levels and insurance coverage because those socioeconomic indicators impact the types of services needed and accessed by residents, along with the frequency at which services are accessed. These considerations are important factors to consider when determining what services are needed in a defined geographic market area. For example, areas characterized by higher household incomes typically have greater access to and use primary care and preventive services more than areas with low household incomes. Similarly, areas with low household incomes tend to have higher rates of Medicaid versus commercial insurance, have higher rates of chronic diseases such as diabetes and congestive heart failure, and use emergency departments more frequently (often for primary care services versus true emergencies).

The Planning Area has a current population of almost 637,000. This population is not expected to increase significantly in the next five years, although it will get older and the population under the age of 45 will actually decrease. In addition, a disproportionately high percent of Planning Residents are uninsured or have Medicaid and may struggle to access the healthcare system for primary and preventive care.

Planning Area Population

The population in the 20 ZIP codes comprising the Planning Area was 636,852 in 2014 as shown in Table 3-1 below. The Planning Area population is projected to grow by only 8,000 residents (1.3%) to 645,000 by 2019 (an overall compound annual growth rate (CAGR) of 0.3% per year). This growth rate is consistent with New Jersey statewide growth, but slower than the U.S. overall, which is expected to grow at 0.7% per year over the same time period.

TABLE 3-1: POPULATION AND GROWTH

Geography	2014 Pop.	2019 Pop.	% Change	CAGR ('14-'19)
Planning Area	636,852	644,977	1.3%	0.3%
New Jersey	8,906,101	9,052,200	1.6%	0.3%
United States	317,199,353	328,309,478	3.5%	0.7%

Source: Claritas; Navigant analysis

While little population growth is expected in the Planning Area as a whole, there are some pockets of growth (three ZIP codes in Newark are projected to grow more than 3% between 2014 and 2019). On the other hand, the Irvington ZIP code (07111), which is the most populous ZIP code in the Planning Area, is expected to decline by 1.6% during the 2014-2019 period. Table 3-2 presents the population and projected growth for each of the Planning Area ZIP codes.

TABLE 3-2: POPULATION AND GROWTH BY ZIP CODE

Zip Code	County	City	2014 Population	2019 Population	% Change	CAGR (2014-2019)
07003	Essex	**Bloomfield**	47,570	47,531	-0.1%	-0.0%
07017	Essex	**East Orange**	35,582	35,522	-0.2%	-0.0%
07018	Essex	**East Orange**	27,984	28,227	0.9%	0.2%
07029	Hudson	**Harrison**	16,349	16,755	2.5%	0.5%
07031	Bergen	**North Arlington**	15,734	16,072	2.1%	0.4%
07032	Hudson	**Kearny**	41,588	42,603	2.4%	0.5%
07050	Essex	**Orange**	30,478	30,057	-1.4%	-0.3%
07102	Essex	**Newark**	11,616	11,894	2.4%	0.5%
07103	Essex	**Newark**	33,614	34,559	2.8%	0.6%
07104	Essex	**Newark**	52,002	53,636	3.1%	0.6%
07105	Essex	**Newark**	47,752	48,703	2.0%	0.4%
07106	Essex	**Newark**	31,194	31,575	1.2%	0.2%
07107	Essex	**Newark**	38,448	39,073	1.6%	0.3%
07108	Essex	**Newark**	25,801	26,635	3.2%	0.6%
07109	Essex	**Belleville**	35,416	35,637	0.6%	0.1%
07110	Essex	**Nutley**	28,808	29,251	1.5%	0.3%
07111	Essex	**Irvington**	53,454	52,585	-1.6%	-0.3%
07112	Essex	**Newark**	26,459	26,716	1.0%	0.2%
07114	Essex	**Newark**	15,136	15,612	3.1%	0.6%
07205	Union	**Hillside**	21,867	22,334	2.1%	0.4%
Total			**636,852**	**644,977**	**1.3%**	**0.3%**

Source: Claritas; Navigant analysis

Similar to the U.S. overall, the Planning Area's 65 to 84 age cohort is projected to grow significantly faster than all other age cohorts, with a 3.5% CAGR between 2014 and 2019, although growth in this cohort and the 85+ cohort will be slower in the Planning Area than nationally. Growth is also expected in the Planning Area in the 45 to 64 age cohort, and at a faster rate than nationally.

Both the population younger than 44 years of age and the female population ages 18 to 44 are projected to decrease between 2014 and 2019 (in contrast to expected growth in these segments for the U.S. overall). These reductions will result in decreased future demand for obstetrics and pediatrics services in the Planning Area.

TABLE 3-3: POPULATION AND GROWTH AND DISTRIBUTION BY AGE COHORT

Age Group	Planning Area 2014 Population	Planning Area 2019 Population	Planning Area 2014-2019 % Change	Planning Area CAGR ('14-'19)	U.S. CAGR (2014-2019)
Under 18	151,679	150,817	-0.6%	-0.1%	0.1%
18 to 44	255,405	247,116	-3.2%	-0.7%	0.3%
45 to 64	158,510	163,847	3.4%	0.7%	0.2%
65 to 84	63,028	74,893	18.8%	3.5%	3.7%
85+	8,230	8,304	0.9%	0.2%	1.2%
Total:	**636,852**	**644,977**	**1.3%**	**0.3%**	**0.7%**
Female 18 to 44	*126,891*	*121,820*	*-4.2%*	*-0.8%*	*0.2%*

Source: Claritas and Navigant analysis

Planning Area Household Income

The Planning Area is considerably less affluent than both New Jersey and the U.S. At just over $59,000, the Planning Area's average household income is 37% lower than that of the state ($94,024) and 17% lower than the U.S. average of $71,319. In fact, every ZIP code in the planning area except 07110 (Nutley) has a lower average household income than the New Jersey average, and only five ZIP codes have average household incomes above the U. S. average, as shown in Table 3-4 below.

TABLE 3-4: AVERAGE HOUSEHOLD INCOME 2014

Zip Code	County	City	Average Household Income (2014)	Zip Code's Avg. Household Income as % of State's Avg. Household Income
07003	Essex	**Bloomfield**	$83,491	89%
07017	Essex	**East Orange**	$49,909	53%
07018	Essex	**East Orange**	$48,409	51%
07029	Hudson	**Harrison**	$70,462	75%
07031	Bergen	**North Arlington**	$83,745	89%
07032	Hudson	**Kearny**	$75,055	80%
07050	Essex	**Orange**	$54,296	58%
07102	Essex	**Newark**	$37,575	40%
07103	Essex	**Newark**	$40,961	44%
07104	Essex	**Newark**	$48,191	51%
07105	Essex	**Newark**	$51,813	55%
07106	Essex	**Newark**	$57,747	61%
07107	Essex	**Newark**	$45,188	48%
07108	Essex	**Newark**	$41,331	44%
07109	Essex	**Belleville**	$75,916	81%
07110	Essex	**Nutley**	$96,125	102%
07111	Essex	**Irvington**	$50,973	54%
07112	Essex	**Newark**	$47,518	51%
07114	Essex	**Newark**	$37,572	40%
07205	Union	**Hillside**	$69,545	74%
Planning Area Total			**$59,074**	
New Jersey			**$94,024**	
United States			**$71,319**	

Source: Claritas and Navigant analysis

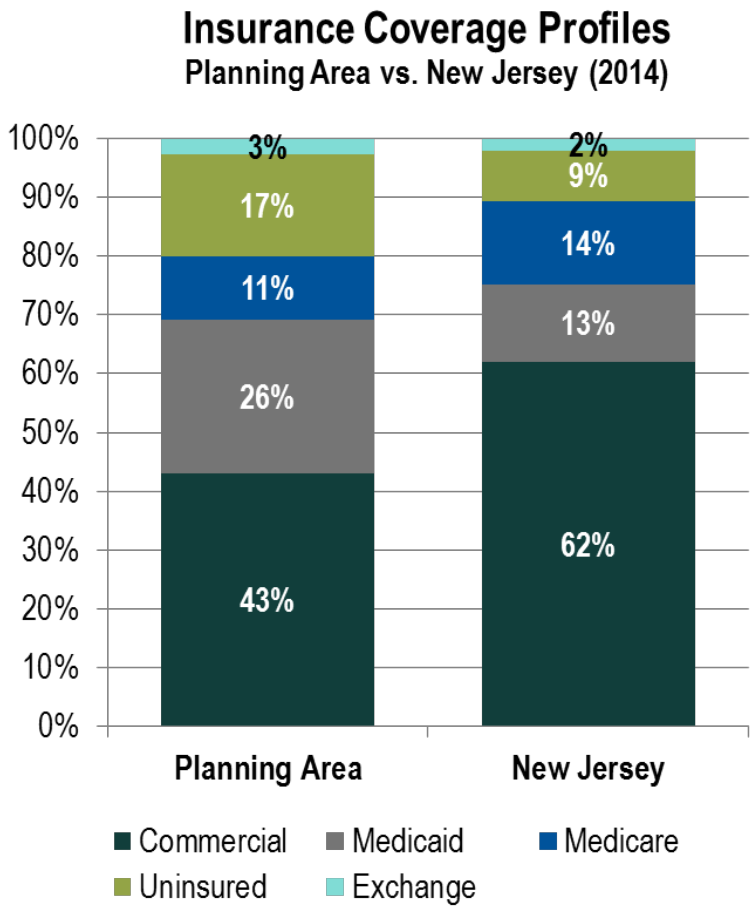
Health Insurance Coverage

Similar to household income, the insurance coverage profile of the Planning Area is significantly different than that of New Jersey overall. Areas with low household income typically have high rates of Medicaid and uninsured and low rates of commercially insured residents. In fact, only 43% of Planning Area residents have commercial insurance (nearly 20% fewer than the state overall) and 26% of Planning Area residents

are covered by Medicaid (compared to just 13% for New Jersey). Also, 17% are uninsured, compared to 9% for the state.

As such, many Planning Area residents likely have difficulty accessing primary and preventive care services, which impacts health status and results in higher usage of high-cost emergency department services.

EXHIBIT 3-1: INSURANCE COVERAGE



Source: Truven Health Care Analytics; Navigant analysis

Health Status

New Jersey counties were ranked by the Robert Wood Johnson Foundation and the University of Wisconsin's Population Health Institute – a higher ranking in both health outcomes and health factors indicates a healthier county population relative to its peers. As shown in Table 3-5 below, Essex County ranks low relative to other New Jersey counties in terms of health outcomes and health factors, according to County Health Rankings, a Robert Wood Johnson Foundation program. In fact, Essex County ranks 20th out of 21 New Jersey state counties in health outcomes

and 17th in health factors. Furthermore, Essex County adults categorized as obese make up 25.9% of the population compared to the New Jersey average of 24.5% and Essex County residents with diabetes make up 9.7% of the population compared to the New Jersey average of 8.9%.

Table 3-5: Health Outcomes & Health Factors Rank by New Jersey County (2014)

Rank	Health Outcomes	Rank	Health Factors
1	Hunterdon	1	Hunterdon
2	Somerset	2	Morris
3	Morris	3	Somerset
4	Bergen	4	Bergen
5	Middlesex	5	Monmouth
6	Monmouth	6	Middlesex
7	Ocean	7	Burlington
8	Sussex	8	Mercer
9	Warren	9	Warren
10	Union	10	Sussex
11	Burlington	11	Ocean
12	Mercer	12	Union
13	Gloucester	13	Gloucester
14	Passaic	14	Cape May
15	Cape May	15	Passaic
16	Hudson	16	Camden
17	Camden	17	Essex
18	Salem	18	Hudson
19	Atlantic	19	Atlantic
20	Essex	20	Salem
21	Cumberland	21	Cumberland

Source: Robert Wood Johnson Foundation

Section 4 – Planning Area Patient Migration Patterns

After defining the relevant Planning Area and establishing a profile of its residents, the next step in the analysis was to understand where Planning Area residents receive their healthcare services, as well as where study hospital patients come from.

Over two-thirds of Planning Area residents received their inpatient care at one of the five study hospitals, with 30% of area residents leaving the Planning Area for care at other New Jersey Hospitals, while 2% of Planning Area residents traveled to New York hospitals for their care. While out-migration of one-third of Planning Area residents is somewhat high, it is not completely unexpected given that the Planning Area is in a densely populated urban area with a well-developed transportation system and nearby world-class academic medical centers.

Planning Area Patient Migration Patterns

In order to assess where Planning Area residents were going for their healthcare services and where the people using the Planning Area hospitals were coming from, we conducted an extensive analysis of patient migration patterns, which included identifying the number of Planning Area residents who used healthcare facilities outside of the Planning Area (those who "out-migrated" from the Planning Area for care), along with identifying the number of people who were not residents of the Planning Area but who received care at one of the Planning Area inpatient facilities ("in-migration" into the Planning Area for care).

Out-migration

Data for calendar year 2013 from the New Jersey Department of Health discharge database and the New York State Department of Health Statewide Planning and Research Cooperative System (SPARCS) database were used to determine healthcare utilization patterns of Planning Area residents at New Jersey and New York hospitals. The results of our analyses showed that the number of Planning Area residents who left the Planning Area for inpatient care (e.g., "out-migration") significantly exceeded the number of people residing outside of the Planning Area who sought inpatient care at one of the study hospitals (e.g., "in-migration").

As shown in Table 4.1 below, nearly 68% of the residents of the Planning Area received their inpatient care in one of the Planning Area hospitals, while 30% of Planning Area residents sought inpatient care at a New Jersey hospital outside of the Planning Area and less than 2% of Planning Area residents traveled to hospitals in New York State for their inpatient care.

TABLE 4-1: PLANNING AREA INPATIENT CARE BY SITE OF HOSPITALIZATION 2013

Metric	5 Study Hospitals	Out-Migration to Other New Jersey Hospitals	Out-Migration to New York Hospitals	All New Jersey and New York Hospitals
Total Discharges Planning Area Residents	52,059	23,336	1,367	**76,762**
Percent of Planning Area Resident Discharges	67.8%	30.4%	1.8%	**100.0%**
CMI	1.4	1.9	1.9	**1.5**

Source: New Jersey and New York Department of Health State discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.

Patient migration patterns are influenced by numerous factors, including employment status and location, insurance coverage status, commuting patterns, patient and physician preference, service availability and access / convenience. That aside, the percentage of Planning Area residents leaving the Planning Area for healthcare services (32%) is perhaps slightly higher than expected, although not necessarily atypical for a densely populated urban area with a well-developed transportation system and access to many other nearby hospitals, including brand-name academic medical centers.

In order to gain a better understanding of residents leaving the Planning Area for care, we analyzed the relative case mix index ("CMI") of the patients who remain in the area for care versus those who left the area for care, as well as the comparative payer mix and service distribution. CMI is a relative value assigned to a diagnosis-related group of patients in a hospital based upon the expected allocation of resources to care for and treat patients in the group. The higher the CMI, the more complex the care required to serve that patient population. The CMI for Planning Area residents cared for in the five study hospitals averaged 1.4, whereas the CMI for patients leaving the area for care at other New Jersey or New York hospitals was higher at 1.9, indicating that Planning Area residents leave for more complex services. This outmigration may be because of any of a variety of factors, including but not limited to, patient preference and physician referral patterns, or because certain services were not available in the Planning Area.

With respect to insurance coverage, Planning Area residents who stayed in the area for their inpatient care had a different insurance coverage profile than Planning Area

residents who left the area for inpatient care. Planning Area residents discharged from hospitals outside the planning area were more than twice as likely to have commercial insurance (16%) vs. Planning Area residents who stayed local (7%) for their care (i.e., were discharged from one of the five study hospitals). Conversely, as expected, Medicaid patients were less likely to out-migrate for care.

This pattern of better insured patients leaving an area for their inpatient care is fairly typical in urban areas and reflects patient preference and socioeconomic factors such as type of employment. Table 4-2 below summarizes where Planning Area residents received inpatient care in 2013, along with the relative CMI of those patients.

TABLE 4-2: INPATIENT PAYER MIX AND CMI FOR PLANNING AREA RESIDENTS

Patient Category	Inpatient Payer Mix: Commercially Insured Proportion	Inpatient Payer Mix: Medicaid Proportion	Case Mix Index
All Planning Area Residents	10.2%	9.3%	1.5
Planning Area Residents who Out-migrated for Inpatient Care	16.5%	8.3%	1.9
Planning Area Residents Discharged From One of the Five Study Hospitals	7.1%	9.7%	1.4

Source: New Jersey and New York Department of Health State discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.

In-migration

In order to determine the need for healthcare services in the Planning Area, residents from outside of the area receiving care at the study hospitals (in-migration) must also be understood. As noted in the discussion regarding the Planning Area definition, most hospitals typically serve a modest percentage of patients from outside their service areas—usually less than 20%. There were 14,425 discharges from the five study hospitals of residents from outside of the Planning Area in 2013 as shown in Table 4-3 below. In-migration at CMMC, EOGH, and SMMC represented 19%, 9%, and 15% of the hospital's activity respectively. Non-Planning Area residents seeking care at CMMC and EOGH had a relatively low CMI of 1.3 and 1.1, respectively. The in-migration to CMMC and EOGH is primarily from residents of ZIP codes adjacent to the Planning Area, which

combined with the relatively low CMI of these patients likely indicates they are migrating into the area because of geographic proximity more so than seeking out specialized or complex care. Conversely, non-Planning Area residents discharged from SMMC had an average CMI of 1.9, which likely reflects the historic draw of SMMC's cardiac service. NBIMC and UH had a higher proportion of their discharges from non-Planning Area residents, with 27% each and average CMI of greater than 2. These statistics reflect the more specialized service offerings at NBIMC and UH: NBIMC offers solid organ transplant (heart, lung, and kidney) and is home to the Children's Hospital of New Jersey, which draw patients from a broader geography than core community hospital services, and UH is the only Level I trauma center in the Planning Area, with only two other Level I centers in the state (Robert Wood Johnson in New Brunswick and Cooper University Hospital in Camden).

TABLE 4-3: PLANNING AREA IN-MIGRATION TO STUDY HOSPITALS 2013

Metrics (2013)	CMMC	EOGH	NBIMC	SMMC	UH	Total 5 Area Hospitals
Discharges Non-Planning Area Residents	3,170	567	5,577	1,218	3,893	**14,425**
Percent of Hospital's Total Discharges	19%	9%	27%	15%	27%	**22%**
CMI	1.3	1.1	2.2	1.9	2.1	**1.9**

Source: New Jersey and New York Department of Health State discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.

Net Migration

Table 4-4 shows the number and percent of discharges by service line that remain within vs. leave the planning area (out-migrate) for care. Of the 21 services assessed, 6 had rates of Planning Area resident out-migration above 40%, including cardiac surgery, gynecology, rehabilitation, spine, thoracic surgery, and transplant. These services are those in which patients, physicians, and payers often select providers based on outcomes, quality, reputation, and cost, even if the providers are further away in terms of distance and travel time.

Table 4-5 then shows the combined effect of out-migration and in-migration for the Planning Area in 2013, both overall and by service line. A total of 24,703 discharges (or 32.2% of total) left the Planning Area, whereas 14,425 discharges in-migrated into the Planning Area, for a net outflow of 10,278 discharges. While most service lines had a net outmigration of patients, a few of the smaller, more tertiary services with wider catchment areas (including cardiac surgery, neurosurgery, transplant and trauma) had a net in-migration of discharges.

TABLE 4-4: PLANNING AREA OUTMIGRATION BY SERVICE LINE 2013

Service Line	Total Planning Area Discharges	Discharges in Planning Area Hospitals	Discharges in Planning Area as % of Total Discharges	Discharges Leaving Planning Area Hospitals	Discharges Leaving Planning Area as % of Total Discharges
Cardiac Services	9,478	7,165	75.6%	2313	24.4%
Cardiac Surgery	529	257	48.6%	272	51.4%
ENT	994	699	70.3%	295	29.7%
General Medicine	23,336	17,089	73.2%	6247	26.8%
General Surgery	6,057	3,861	63.7%	2196	36.3%
Gynecology	1,044	595	57.0%	449	43.0%
Neonatology	3,015	1,871	62.1%	1144	37.9%
Neurology	3,769	2,667	70.8%	1102	29.2%
Neurosurgery	460	285	62.0%	175	38.0%
Obstetrics	9,824	5,984	60.9%	3840	39.1%
Oncology/Hematology	3,306	2,303	69.7%	1003	30.3%
Ophthalmology	142	106	74.6%	36	25.4%
Orthopedics	2,834	1,746	61.6%	1088	38.4%
Psychiatry	7,443	4,598	61.8%	2845	38.2%
Rehabilitation	51	0	0.0%	51	100.0%
Spine	861	353	41.0%	508	59.0%
Thoracic Surgery	355	208	58.6%	147	41.4%
Transplant	8	4	50.0%	4	50.0%
Trauma	494	329	66.6%	165	33.4%
Urology	1,046	691	66.1%	355	33.9%
Vascular Services	1,716	1,248	72.7%	468	27.3%
All Service Lines	**76,762**	**52,059**	**67.8%**	**24,703**	**32.2%**

TABLE 4-5: PLANNING AREA NET MIGRATION BY SERVICE LINE 2013

Service Line	Total Planning Area Out-migration	Total Planning Area In-migration	Net Outmigration (In-migration)
Cardiac Services	2,313	1,678	635
Cardiac Surgery	272	615	(343)
ENT	295	335	(40)
General Medicine	6,247	3,261	2986
General Surgery	2,196	1,289	907
Gynecology	449	269	180
Neonatology	1,144	439	705
Neurology	1,102	618	484
Neurosurgery	175	195	(20)
Obstetrics	3,840	1,000	2840
Oncology/Hematology	1,003	789	214
Ophthalmology	36	110	(74)
Orthopedics	1,088	913	175
Psychiatry	2,845	1,636	1209
Rehabilitation	51	0	51
Spine	508	240	268
Thoracic Surgery	147	68	79
Transplant	4	25	(21)
Trauma	165	190	(25)
Urology	355	356	(1)
Vascular Services	468	399	69
All Service Lines	**24,703**	**14,425**	**10,278**

Source: New Jersey and New York Department of Health discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.

Section 5 – Healthcare Resources in the Planning Area: Current and Historical Trends

After defining the Planning Area and profiling the population's demographic characteristics and healthcare utilization patterns, we developed an inventory of healthcare services available in the Planning Area and assessed trends in both supply and demand for healthcare services. This section of the report provides an overview of the healthcare resources in the defined Planning Area, both historical and current, an assessment of the trend in demand for healthcare services, and summary profiles of the five study hospitals, the Federally Qualified Health Centers, and Broadway House.

Historical Trends in the Planning Area

Trends in Planning Area healthcare utilization over time provide a context for understanding current market dynamics, as well as provide a basis for determining likely future utilization levels. Between 1999 and 2013, the Newark Union Metropolitan Statistical Area (a broader region than the Planning Area as described in Section 2) experienced a 30% reduction in staffed beds (from 8,298 to 5,783) and a 28% reduction in hospital average daily census (from 5,635 to 4,085), despite population growth of approximately 2%. In response to the steep decline in hospital average daily census and resulting inpatient overcapacity in the region, a number of hospitals in the region have closed since 1999, as shown in Table 5-1 below. Specifically, six hospitals in the Planning Area have closed over the past fifteen years: St. Mary's Hospital, West Hudson Hospital, Hospital Center at Orange, Irvington General Hospital, Columbus Hospital, and St. James Hospital.

TABLE 5-1: AREA HOSPITAL CLOSURES SINCE 1999

Hospital Closures in Newark-Union MSA and Planning Area Since 1999		
Year	**No. of Hospitals**	**Hospital Name(s)**
1999	2	**Montclair Community Hospital**[1]; and **St. Mary's Hospital (Orange)**[2]
2000	1	**Elizabeth General**[1]
2003	1	**West Hudson Hospital**[2]
2004	1	**Hospital Center at Orange**[2]
2006	1	**Irvington General Hospital**[2]
2007	1	**Union Hospital** [1]
2008	3	**Columbus Hospital (Newark)**[2]; **Muhlenberg Regional Medical Center (Plainfield)**[1]; and **St. James Hospital (Newark)**[2]
2012	1	**St. Clare's Sussex**[1]

Source: Navigant analysis of information provided by State of New Jersey Department of Health
(1): Indicates hospital was located in Newark-Union MSA.
(2): Indicates hospital was located in Planning Area.

Recent Utilization Trends for Inpatient Services

More recently, the number of inpatient hospital discharges of Planning Area residents declined substantially, dropping 9.2% between 2011 and 2013. Discharges at the five Planning Area hospitals declined at a faster rate than the overall market, declining 14% over the same time period. As a result of this faster than market decline in discharges, the combined market share of the study hospitals in the Planning Area declined from 71.2% in 2011 to 67.8% in 2013, a decline of 3.4 percentage points. This means that the five study hospitals are serving a smaller percentage of a shrinking market. Table 5-2 shows inpatient utilizations trends in the Planning Area for the 2011-2013 period.

TABLE 5-2: PLANNING AREA INPATIENT HOSPITAL UTILIZATION

Year	Total Planning Area Discharges	Total Study Hospital Discharges	Study Hospitals Planning Area Discharges	Planning Area Mkt. Shr.
2011	84,521	77,294	60,246	71.2%
2012	81,877	73,145	57,275	70.0%
2013	76,762	66,484	52,059	67.8%
% Change ('11-'13)	**-9.2%**	**-14.0%**	**-13.6%**	**-3.4%**

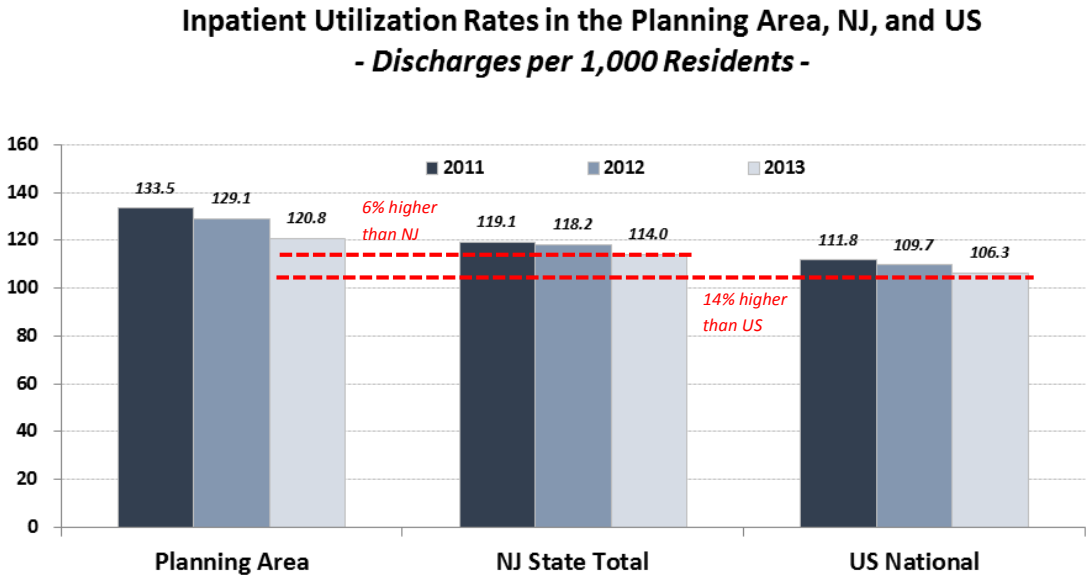
Source: New Jersey and New York Department of Health discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns)

Although inpatient volume declined in the Planning Area over the past several years, the inpatient use-rate (defined as the number of inpatient discharges per capita) in the Planning Area remains 6% higher than the overall New Jersey State rate and 14% higher than the U.S. rate, as shown in Table 5-3 below. It is important to note that declines in inpatient use-rates and inpatient discharges are not trends unique to the Planning Area – discharges and use-rates are decreasing in New Jersey as well as nationally. These declines are the result of a number of factors, including:

- The lingering effects of the "Great Recession," which suppressed utilization of health services
- Growth in/shift of patients to observation status vs. being admitted as an inpatient
- Continued shift of volumes from inpatient to outpatient settings
- Growth in high deductible insurance plans, which is reducing utilization
- Shift to value-based/population health management and improvements in care management

These trends are expected to continue to have a major impact on health services utilization for the foreseeable future both nationally and in the New Jersey market. Therefore, even though the inpatient use-rate in the Planning Area has declined significantly in the last few years, it is likely that the Planning Area will continue to see reduced inpatient utilization rates and inpatient volumes in the future, as the utilization rate in the Planning Area continues to be impacted by the changing dynamics of the healthcare industry.

TABLE 5-3: AREA HOSPITAL UTILIZATION RATES



Source: New Jersey and New York Department of Health discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns)

In addition to inpatient utilization rates, a second factor that is critical to determining the future need for hospital beds is the number of days that each patient stays in the hospital -- the average length of stay (ALOS). Between 2011 and 2013, the ALOS increased nominally for the State of New Jersey overall, from 5.15 to 5.20 days, as shown in Table 5-4. However, the combined length of stay for the five study hospitals (which was already 11.3% higher than the state average in 2011) increased by 0.13 days in 2013, a figure 12.7% above the state average. The longer length of stay in the study hospitals is likely attributable to a number of factors, including difficulty in placing patients in post-acute settings and a more traditional model of physician practice (i.e., predominately small groups and solo practitioners), which makes clinical integration and coordination of care more difficult. The combination of continued declines in inpatient use-rates and the potential for a future decrease in ALOS would result in reduced need for inpatient hospital beds and generate additional excess, underutilized capacity in the Planning Area.

TABLE 5-4: LENGTH OF STAY TRENDS

Year	Total Discharges	Total Days	ALOS
All New Jersey Hospitals			
2011	979,835	5,042,604	**5.15**
2012	955,459	4,911,557	**5.14**
2013	925,106	4,813,846	**5.20**
Total Study Hospitals			
2011	77,294	442,549	**5.73**
2012	73,145	424,305	**5.80**
2013	66,484	389,638	**5.86**

Source: New Jersey and New York Department of Health discharge databases; Navigant analysis.
Note: Excludes DRG 795 (normal newborns)

Overview of Planning Area Healthcare Resources

In this section we provide an overview of healthcare services available in the Planning Area. While all five hospitals have emergency departments and provide inpatient medical/surgical care and inpatient behavioral health services, there is some service differentiation among the Planning Area hospitals. Three hospitals, NBIMC, SMMC, and UH, provide cardiac surgery services and three hospitals provide obstetrics and inpatient pediatrics services, CMMC, NBIMC, and UH. There are two Level III neonatal intensive care units (NICU) in the Planning Area located at NBIMC and UH and one Level II NICU at CMMC. NBIMC and UH offer transplant services, although there is no overlap in organ types, with NBIMC providing kidney, heart, and lung transplant and UH providing liver transplantation. Clearly some ad hoc service rationalization has taken place in the Planning Area (for example, EOGH and SMMC no longer provide obstetrics or inpatient pediatric services). Also, UH is the only Level I Trauma Center in the Planning Area.

TABLE 5-5: DISTRIBUTION OF KEY HOSPITAL SERVICES AT STUDY AREA HOSPITALS

Service	CMMC	EOGH	NBIMC	SMMC	UH	Total for Five Hospitals
Behavioral Health	x	x	x	x	x	5
Level I Trauma					x	1
Neurosurgery			x		x	2
Neonatal Intensive Care Unit	x		x		x	3
Obstetrics	x		x		x	3
Cardiac Surgery			x	x	x	3
Orthopedic Surgery	x		x	x	x	4
Pediatric Intensive Care Unit			x		x	2
Inpatient Pediatrics	x		x		x	3
Kidney Transplant			x			1
Liver Transplant					x	1
Heart Transplant			x			1
Lung Transplant			x			1
Post-Acute Care	x				x	2

Source: NJDOH Division of Health Facilities Evaluation and Licensing, OPTN http://optn.transplant.hrsa.gov)

In addition to the acute care services described above, both CMMC and UH offer transitional care services. Clara Maass has a 20-bed transitional care unit that provides sub-acute care focused on cardiac recovery, post-surgical recovery, oncology and pain management, pulmonary management, skin and wound care, and complex medical management. On the UH campus, Broadway House offers long term post-acute care focused on the HIV / AIDS patient population. However, given this focus and the improvements in HIV / AIDS treatments and outcomes, Broadway House has seen a steady decline in occupancy, which has negatively impacted its financial performance. As such, Broadway House's declining census provides an opportunity to repurpose the facility to serve a broader population, which has been recognized with the recent approval of a Certificate of Need to convert 16 of Broadway House's 78 beds to use by patients requiring general transitional care. Lastly, EOGH operates a forensics unit dedicated to providing inpatient care to inmates.

In addition to inpatient resources, there are ambulatory or outpatient resources available in the Planning Area. The State of NJ Department of Health lists 115 ambulatory care facilities in Essex County excluding hospice and hospitals. Please see the Appendix for the detailed inventory. However, most of the core, general acute care services are located on the hospital campuses, and the study hospitals do not offer a distributed network of

ambulatory locations to improve access and convenience to residents throughout the Planning Area.

Federally Qualified Health Centers (FQHCs) are community-based organizations that provide comprehensive primary care and preventive care, including health, oral, and mental health/substance abuse services to persons of all ages, regardless of their ability to pay or health insurance status. Thus, FQHCs are a critical component of the healthcare safety net. FQHCs include all organizations receiving grants under section 330 of the Public Health Service Act and qualify for enhanced reimbursement from Medicare and Medicaid, as well as other benefits. FQHCs must:

- Serve an underserved area or population
- Offer a sliding fee scale
- Provide comprehensive services
- Have an ongoing quality assurance program
- Have a governing board of directors

There are three FQHCs in the Planning Area with 18 locations that serve approximately 160,000 people per year. Each Planning Area hospital is affiliated with at least one FQHC. Table 5-6 presents an overview of the FQHCs in the Planning Area.

TABLE 5-6
FEDERALLY QUALIFIED HEALTH CENTERS SERVING THE PLANNING AREA

	Newark-Area FQHCs		
	Newark Homeless Healthcare	Newark Community Health Centers	Jewish Renaissance
Number of Locations	3	7	8
Approximate Patients Served Annually	4,000	120,300	34,000
Specialties Provided			
Adult & Family Medicine	x	x	x
Dental	x	x	x
ENT		x	
OB/GYN	x	x	x
Optometry		x	
Pediatrics	x	x	x
Podiatry		x	
Endocrinology	x		
Laboratory	x	x	
Behavioral Health	x	x	x
Planning Area Hospital Affiliations			
CMMC		x	
EOGH		x	
NBIMC		x	x
SMMC	x		
UH		x	
Other Hospital Affiliations			
St. James Hospital		x	
Raritan Bay Medical Center			x

Source: FQHC data request; Organizational websites; Navigant analysis.

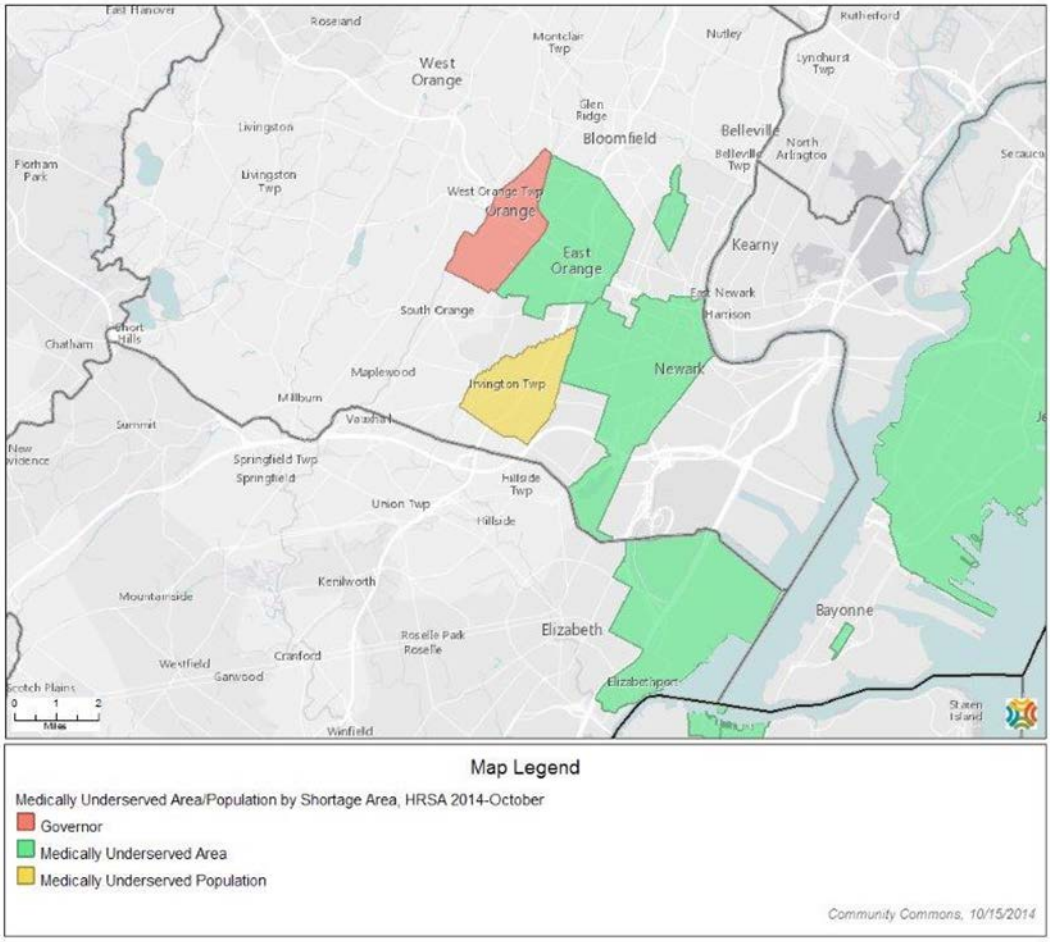
Medically Underserved Areas

The federal Medically Underserved Area (MUA) and Medically Underserved Population (MUP) designations identify areas and populations that have limited access to primary care services (as measured by a population-to-provider ratio). Medically Underserved Populations (MUPs) may include groups of persons who face economic, cultural or linguistic barriers to healthcare. MUA/P designations are used to qualify for state/local and federal programs aimed at increasing health services to underserved areas and populations. MUA determinations are based on an Index of Medical Underservice (IMU) for a defined service area (i.e., group of census tracts that represent a neighborhood with similar socioeconomic and demographic characteristics). IMU calculations rely on data on demographic indicators associated with underservice including the ratio of primary medical care physicians per 1,000 population, infant mortality rate, percentage of the population with incomes below the poverty level, and percentage of the population age 65 or over.

Several areas in the Planning Area are designated as Medically Underserved Areas or Medically Underserved Populations. The designation of portions of the Planning Area as MUA/P is an important indication that there are unique features of an underserved population that need to be considered when determining future service needs and exploring potential reconfiguration of services in the area. For example, inadequate access to primary care may lead to increased use of hospital emergency departments for non-acute medical concerns and/or conditions that could have been avoided with appropriate primary care.

As seen in Figure 5-1 below, several areas in the Planning Area have been designated as MUA or MUP areas. Governor-certified shortage areas are designated by state governors as having shortages of providers.

FIGURE 5-1: MEDICALLY UNDERSERVED AREAS IN THE PLANNING AREA



Descriptions and Service Complement of Study Area Hospitals

This section of the report builds upon the overview presented in the previous section by providing additional detail for each of the Planning Area hospitals, including location, specialty services and programs, current capacity, recent utilization, and recent financial performance.

Clara Maass Medical Center

Founded in 1868, Clara Maass Medical Center (CMMC) is a general acute care facility in the northern portion of the Planning Area on Old Short Hills Road close to the Branch Brook Park. CMMC is part of Barnabas Health. Licensed for 460 beds, CMMC has a current maintained bed complement of 285 beds. This number will increase to 317 when the additional 32-bed medical/surgical unit currently under construction is completed. In addition to general medical and surgical care, CMMC's inpatient service complement

includes critical care, pediatrics, oncology, obstetrics, and psychiatry. Key centers and services include:

- The Women's Health Center
- The Cancer Center at Clara Maass
- Diagnostic Cardiac Services including Cardiac Catheterization
- The Pain Management Center
- The Joint & Spine Institute
- Vascular Center
- Same Day Surgery
- The Wound Center at Clara Maass
- The Center for Sleep Disorders
- The Bariatric Surgery Center

Clara Maass Medical Center Inpatient Bed Utilization

With an ADC of 230, inpatient bed occupancy at CMMC was 81% in 2013 based upon available beds, the highest of the study hospitals.

TABLE 5-7: CMMC BED UTILIZATION

Bed Type	Med/Surg	Obstetrics	Behavioral	Total
Licensed Beds	391	27	42	**460**
Available Beds	232	13	40	**285**
2013 ADC	183	12	35	**230**
2013 Occupancy (Licensed beds)	47%	44%	83%	**50%**
2013 Occupancy (Available beds)	**79%**	**92%**	**88%**	**81%**

Clara Maass Medical Center Financial Performance

CMMC experienced a 6% decline in operating revenue between 2012 and 2013 from $277 Million to $261 Million, while expenses did not decrease proportionately, as shown in Table 5-8. While operating performance remained positive in 2013, operating margin decreased 29% from $20 Million to $14 Million. However, CMMC was one of only two (along with NBIMC) study hospitals with positive operating performance in 2013.

TABLE 5-8: CMMC INCOME STATEMENTS

Clara Maass

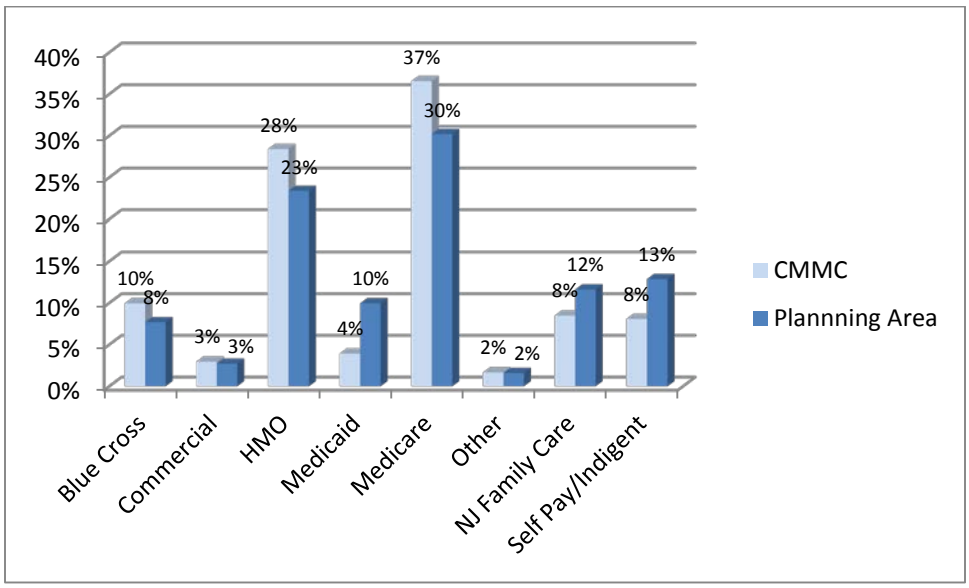
Income Statements

	FY2012	FY2013
$$ in Thousands		
Revenue		
Combined IP and Outpatient Net Revenue	$277,023	$260,671
Bad Debt	($20,468)	($19,260)
NJ State Subsidy	$8,883	$8,359
Net Patient Service Revenue	**$265,438**	**$249,770**
Other Operating Revenue	$11,702	$11,092
Total Operating Revenue	**$277,140**	**$260,862**
Operating Expenses		
Salary/Wage	$110,402	$105,921
Fringe Benefits	$28,360	$27,209
Supplies	$42,413	$40,691
Purchased Services	$22,380	$21,472
Insurance	$3,339	$3,203
Other	$13,597	$13,045
Interest	$3,346	$3,210
Depreciation and Amortization	$8,299	$7,962
Management Fees/Assessment	$24,981	$23,967
Total Operating Expense	**$257,116**	**$246,680**
Operating Income	**$20,024**	**$14,182**

Clara Maass Medical Center Payer Mix

In 2013 CMMC had a higher proportion of discharges from Medicare, HMO, and Blue Cross than the Planning Area overall as shown in Figure 5-2. CMMC had a lower number of Medicaid, New Jersey Family Care and self-pay / indigent patients than the overall area, which likely contributes to its continued stronger financial performance than other study hospitals. Note that Blue Cross HMO patients are included in the HMO category in the payer mix figures (this is true of all the payer mix analyses that follow).

FIGURE 5-2: CMMC PAYER MIX 2013



East Orange General Hospital

Founded in 1903 East Orange General Hospital (EOGH) is a general acute care facility in the western portion of the Planning Area on Central Avenue. EOGH is an independent hospital licensed for 212 beds, with a maintained bed complement of 207 beds. In addition to general medical and surgical care, EOGH's inpatient service complement includes:

- Critical care
- Oncology
- Psychiatry
- Forensic Unit

East Orange General Hospital Inpatient Bed Utilization

Inpatient bed occupancy based on available beds at EOGH was only 54% in 2013, which is significantly below industry target occupancy rates. On a service specific basis, EOGH recorded 53% occupancy in med/surg (compared to generally accepted industry target of 80-85%) and 59% in behavioral health (compared to an industry target of 90%). ADC was just over 110 (the lowest of the 5 hospitals), with an ADC of 90 in med/surg and 22 in behavioral health.

TABLE 5-9: EOGH BED UTILIZATION

Bed Type	Med/Surg	Obstetrics	Behavioral	Total
Licensed Beds	175	N/A	37	**212**
Available Beds	170	N/A	37	**207**
2013 ADC	90	N/A	22	**112**
2013 Occupancy (Licensed beds)	51%	N/A	59%	**53%**
2013 Occupancy (Available beds)	**53%**	**N/A**	**59%**	**54%**

East Orange General Hospital Financial Performance

EOGH had a negative operating margin in both 2012 and 2013, with the loss increasing to $10.9 Million in 2013 as shown in the Income Statement in Table 5-10. The acceleration of the operating loss resulted from a 6.5% reduction in operating revenue and a slight increase in operating expenses. EOGH's financial position does not appear sustainable and would require a significant additional ongoing subsidy without fundamental changes in the organization's operations and/or business model.

TABLE 5-10: EOGH INCOME STATEMENTS

East Orange General Hospital
Income Statements

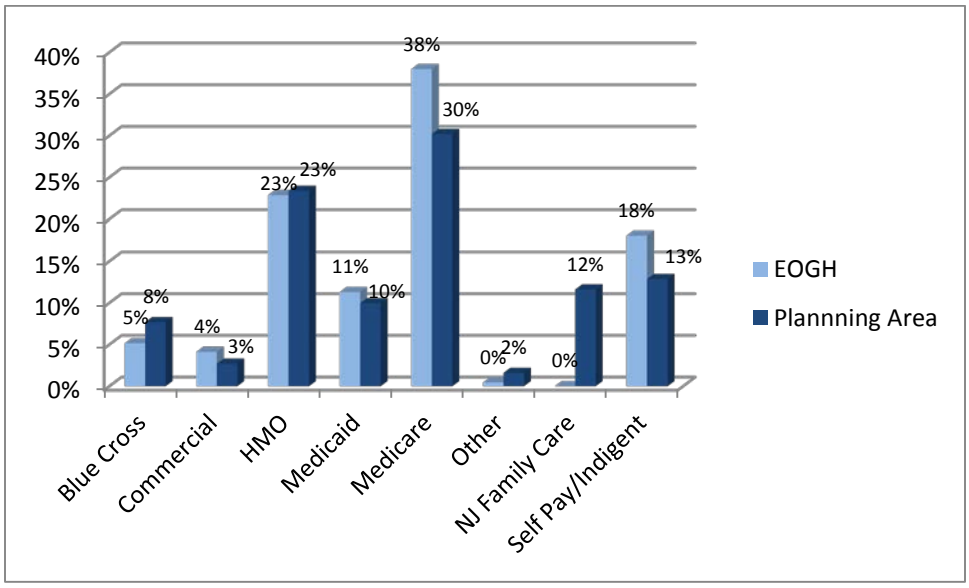
	2012	2013
$ in Thousands		
Revenue		
Combined IP and Outpatient Net Revenue	$91,270	$82,601
Bad Debt	($12,551)	($11,125)
NJ State Charity Care Subsidy	$11,268	$11,141
Other Subsidy	$6,897	$7,864
Net Patient Service Revenue	**$96,883**	**$90,482**
Other Operating Revenue	$9,781	$9,236
Total Operating Revenue	**$106,665**	**$99,718**
Operating Expenses		
Salary/Wage	$54,097	$51,791
Fringe Benefits	$11,062	$11,142

Supplies	$30,623	$31,771
Purchased Services	$6,726	$8,523
Insurance	$2,244	$2,068
Interest	$754	$945
Depreciation and Amortization	$3,995	$4,357
Total Operating Expense	$109,501	$110,598
Operating Income	**($2,837)**	**($10,880)**

East Orange General Hospital Payer Mix

In 2013 EOGH had a higher proportion of discharges from Medicare (38% vs. 30%), and self-pay / indigent care (18% vs. 13%) than the Planning Area overall as shown in Figure 5-3. The proportion of EOGH patients with HMO coverage was the same as the overall Planning Area at 23%.

FIGURE 5-3: EOGH PAYER MIX 2013



Newark Beth Israel Medical Center

Founded in 1901, Newark Beth Israel Medical Center (NBIMC) is a general acute care facility in the southern portion of the Planning Area on Lyons Avenue. NBIMC is a member of Barnabas Health. Licensed for 596 beds, NBIMC has a maintained bed complement of 420 beds. In addition to general medical and surgical care, NBIMC's inpatient service complement includes critical care, cardiac surgery, neonatology, neurosurgery, obstetrics, oncology, orthopedics, pediatrics, psychiatry and transplant services. Key centers and services include:

- Center for Women's Health
- Frederick B. Cohen Comprehensive Cancer and Blood Disorders Center
- Center for Geriatric Health Care
- Hemophilia Treatment Center
- Sleep Disorders Center
- Wound Care and Hyperbaric Institute
- Children's Hospital of New Jersey

Newark Beth Israel Medical Center Inpatient Bed Utilization

NBIMC's 2013 ADC was 324, the highest of the five study hospitals. Inpatient bed occupancy based on available beds at NBIMC was 79% in 2013, nearly at industry targets. Service specific occupancy rates were 79% for medical/surgical, 94% for obstetrics, and 69% in behavioral health.

TABLE 5-11: NBIMC BED UTILIZATION

Bed Type	Med/Surg	Obstetrics	Behavioral	Total
Licensed Beds	519	32	45	**596**
Available Beds	332	43	45	**420**
2013 ADC	262	31	31	**324**
2013 Occupancy (Licensed beds)	50%	97%	69%	**54%**
2013 Occupancy (Available beds)	**79%**	**94%**	**69%**	**79%**

Newark Beth Israel Medical Center Financial Performance

NBIMC was one of the two study hospitals with positive operating performance in 2012 and 2013 (CMMC was the other). However, like CMMC, NBIMC's operating performance declined from 2012 to 2013 with a positive operating income of $14.1 Million in FY 2012 decreasing to $3.7 Million in FY 2013. This was due to a 4% decline in total operating revenue from $583 Million in FY 2012 to $560 Million in FY 2013, while operating expenses decreased by only 2.2%.

TABLE 5-12: NBIMC INCOME STATEMENTS

Newark Beth Israel Medical Center

Income Statements

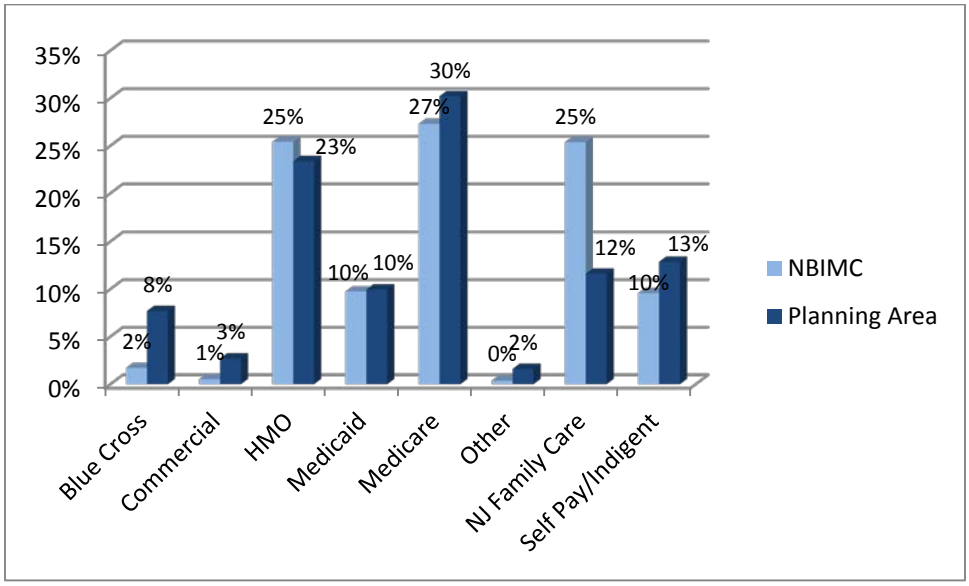
	FY2012	FY2013
$ in Thousands		
Revenue		
Combined IP and Outpatient Net Revenue	$484,394	$460,676
Bad Debt	($19,350)	($18,403)
NJ State Subsidy	$50,895	$48,403
Other Subsidy	$0	$0
Net Patient Service Revenue	**$515,939**	**$490,676**
Other Operating Revenue	$67,185	$69,364
Total Operating Revenue	**$583,124**	**$560,041**
Operating Expenses		
Salary/Wage	$260,041	$254,239
Fringe Benefits	$59,804	$58,470
Supplies	$95,660	$93,526
Purchased Services	$29,192	$28,540
Insurance	$12,440	$12,162
Other	$43,571	$42,599
Interest	$7,921	$7,745
Depreciation and Amortization	$17,618	$17,225
Management Fees/Assessment	$42,802	$41,847
Total Operating Expense	**$569,049**	**$556,353**
Operating Income	**$14,075**	**$3,687**

Newark Beth Israel Medical Center Payer Mix

NBIMC's 2013 proportion of HMO, Medicaid, Medicare, and self-pay/indigent patients was similar to those of the overall market. NBIMC had a lower proportion of Blue Cross patients (2%) compared to the Planning Area (8%). NBIMC has an especially high mix of

NJ Family Care, New Jersey's publicly funded health insurance program for low income residents (including children) that may not quality for traditional Medicaid.

FIGURE 5-4: NEWARK BETH ISRAEL MEDICAL CENTER PAYER MIX 2013



Saint Michael's Medical Center

Founded in 1867, Saint Michael's Medical Center (SMMC) is a general acute care facility in the central portion of the Planning Area on Central Avenue. SMMC is a member of Trinity Health (formerly Catholic Health East). Licensed for 358 beds, SMMC has a maintained bed complement of 248 beds. In addition to general medical and surgical care, SMMC's inpatient service complement includes cardiac surgery, critical care, oncology, and psychiatry. Key centers and services include:

- Heart and Vascular Institute
- Metabolic and Bariatric Center
- Liver Center
- Sleep Center
- Cancer Center
- The Connie Dwyer Breast Center

Saint Michael's Medical Center Inpatient Bed Utilization

SMMC had an ADC similar to EOGH in 2013: 116 patients. Inpatient bed occupancy based on available beds at SMMC was just 47% in 2013, the lowest of the study hospitals and significantly below industry targets. Med/surg occupancy of 45% is very low compared to industry target of 80-85%. Behavioral health occupancy was higher at 62%, but still low compared to an industry target of 90%.

TABLE 5-13: SMMC BED UTILIZATION

Bed Type	Med/Surg	Obstetrics	Behavioral	Total
Licensed Beds	317	N/A	41	**358**
Available Beds	227	N/A	21	**248**
2013 ADC	103	N/A	13	**116**
2013 Occupancy (Licensed beds)	32%	N/A	32%	**32%**
2013 Occupancy (Available beds)	**45%**	**N/A**	**62%**	**47%**

St. Michael's Medical Center Financial Performance

SMMC had negative operating performance in 2012 and while 2013 showed improvement, due to significant expense reduction, operating losses in 2013 still exceeded $14 Million. As with EOGH, SMMC's financial position does not appear sustainable and would likely require a significant additional ongoing subsidy without fundamental changes in the organization's operations and/or business model.

TABLE 5-14: SMMC INCOME STATEMENTS

St. Michael's Medical Center

Income Statements

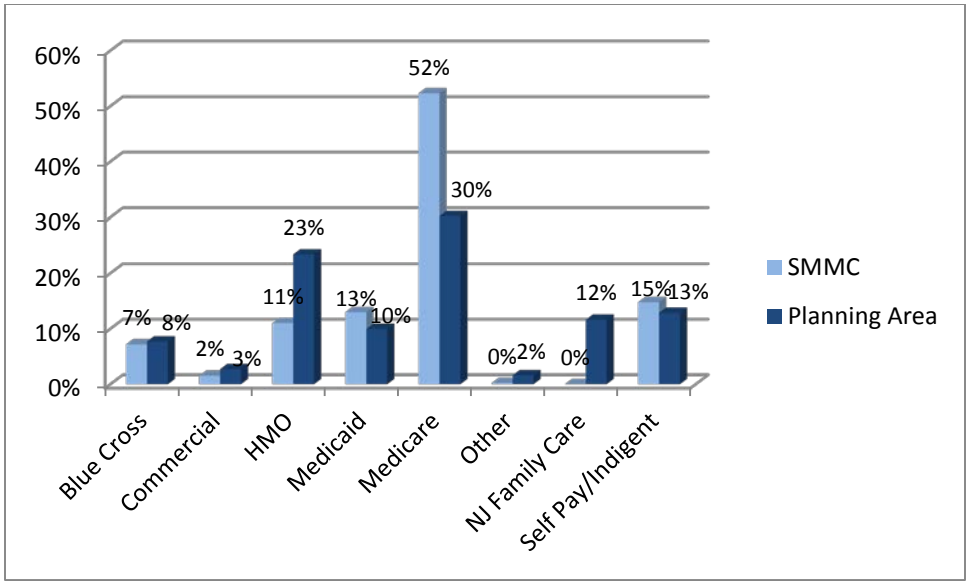
	2012	2013
$ in Thousands		
Revenue		
Combined IP and Outpatient Net Revenue	$166,989	$161,686
Bad Debt	($9,509)	($11,796)
NJ State Charity Care Subsidy	$24,677	$25,975
Other Subsidy	$3,152	$0
Net Patient Service Revenue	**$185,309**	**$175,865**
Other Operating Revenue	$16,430	$16,442
Total Operating Revenue	**$201,739**	**$192,307**

Operating Expenses		
Salary/Wage	$77,881	$72,887
Fringe Benefits	$25,960	$24,296
Supplies	$30,679	$27,784
Purchased Services	$72,157	$58,927
Insurance	$1,369	$1,141
Interest	$17,144	$15,972
Depreciation and Amortization	$13,095	$5,621
Total Operating Expense	**$238,285**	**$206,628**
Operating Income	**($36,546)**	**($14,321)**

St. Michael's Medical Center Payer Mix

Of 2013 inpatients at SMMC, 65% were covered by Medicare or Medicaid and an additional 15% were self-pay / indigent. The high proportion of government payment is a significant challenge for hospital financial performance given reimbursement reductions from Medicare and Medicaid.

FIGURE 5-5: ST. MICHAEL'S MEDICAL CENTER PAYER MIX 2013



University Hospital

University Hospital (UH) traces its origins back to the 1880s when it was operated as City Hospital. Since that time, UH has gone through a number of organizational changes, with the most recent one occurring in 2013 when UH became a distinct entity with its own Board through the New Jersey Medical and Health Sciences Education Restructuring Act. UH is an Academic Medical Center in the central portion of the Planning Area on Bergen Street and serves as the primary teaching site for the Rutgers New Jersey Medical School. UH is licensed for 467 beds and has a maintained bed complement of 360 beds. In addition to general medical and surgical care, UH's inpatient service complement includes cardiac surgery, critical care, neurosurgery, neonatal intensive care, obstetrics, oncology, orthopedics, ophthalmology, pediatrics, pediatric intensive care, psychiatry, and transplant services. Key centers and services include:

- Level I Trauma Center
- Broadway House (long term care facility for HIV/AIDS patients)
- Aortic Surgery Center
- The Center for Liver Diseases and Transplantation
- Stroke Center

University Hospital Inpatient Bed Utilization

UH had an ADC of 245 patients in 2013. Both overall inpatient bed occupancy and med/surg occupancy at UH were below industry targets at 68% in 2013 based upon available beds.

TABLE 5-15: UH BED UTILIZATION

Bed Type	Med/Surg	Obstetrics	Behavioral	Total
Licensed Beds	403	30	34	**467**
Available Beds	296	30	34	**360**
2013 ADC	201	13	31	**245**
2013 Occupancy (Licensed beds)	50%	43%	91%	**52%**
2013 Occupancy (Available beds)	**68%**	**43%**	**91%**	**68%**

University Hospital Financial Performance

UH's operating performance declined between 2012 and 2013 resulting in a loss of over $24 Million in FY 2013. This downturn in performance was due to a 6% reduction in total operating revenue from $492 Million to $464 Million, while expenses increased slightly as shown in the Income Statement in Table 5-16.

TABLE 5-16: UH INCOME STATEMENTS

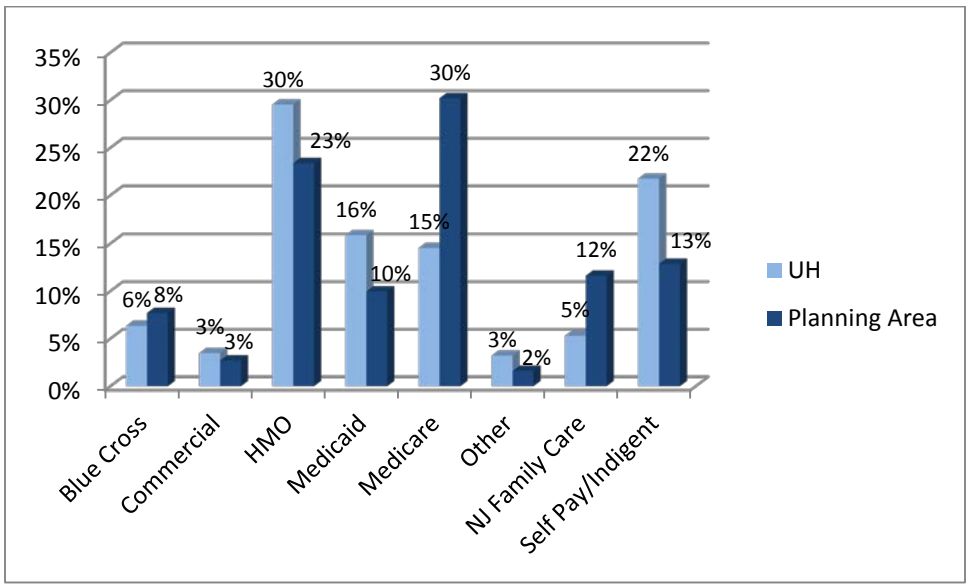
University Hospital
Income Statements

	FY2012	FY2013
$$ in Thousands		
Revenue		
Combined IP and Outpatient Net Revenue	$484,870	$468,632
Bad Debt	($127,404)	($137,829)
NJ State Charity Care Subsidy	$116,455	$115,098
Net Patient Service Revenue	**$473,921**	**$445,901**
Other Operating Revenue		
Other Subsidy	$12,946	$9,446
Fringe Subsidy	$0	$0
Other Revenue	$5,326	$9,036
Total Operating Revenue	**$492,193**	**$464,383**
Operating Expenses		
Salary/Wage	$263,171	$269,393
Fringe Benefits	$0	$0
Supplies	$171,841	$169,091
Purchased Services	$0	$0
Insurance	$0	$0
Other	$12,266	$8,766
Interest	$5,341	$5,156
Depreciation and Amortization	$14,042	$16,179
Management Fees/Assessment	$19,991	$20,280
Total Operating Expense	**$486,652**	**$488,865**
Operating Income	**$5,541**	**($24,482)**

University Hospital Payer Mix

In 2013, 22% of UH's patients were self-pay / indigent and an additional 16% were covered by Medicaid. UH's proportion of patients with HMO coverage was 30% compared to 23% in the Planning Area.

FIGURE 5-6: UNIVERSITY HOSPITAL PAYER MIX 2013



Overall Study Hospital Inpatient Bed Utilization

In total, the occupancy rate across the five study hospitals was 69% in 2013 (with med/surg at 68% and obstetrics and behavioral health each higher at 74% and 75% respectively). These occupancy levels indicate there is currently excess inpatient capacity among study hospitals. As noted in previous sections, population growth in the Planning Area is expected to be quite modest and inpatient utilization (and perhaps ALOS) are expected to decline in the future, which will result in an increase in excess inpatient capacity in the Planning Area in the future.

TABLE 5-17: OVERALL PLANNING AREA HOSPITAL BED COMPLEMENT AND UTILIZATION

Bed Type	Study Hospital Total			
	Medical/Surgical	Obstetrics	Behavioral	Total
Licensed Beds	1,805	89	199	**2,093**
Available Beds	1,242*	76	177	**1,495***
2013 Average Daily Census	839	56	132	**1,027**
2013 Occupancy (Licensed beds)	46%	63%	66%	**49%**
2013 Occupancy (Available beds)	**68%**	**74%**	**75%**	**69%**

Source: Internal client data; Navigant analysis.

*CMMC additional 32 bed med/surg unit under construction will increase total study hospital available beds to 1,527 (and med/surg beds to 1,274) when complete.

Financial Performance of the Study Hospitals

In aggregate, the study hospitals generated $1.58 Billion in operating revenue in 2013, down 6.2% from $1.67 Billion in 2012 (which reflects the declines in inpatient utilization referenced previously in this document). Newark Beth Israel Medical Center and University Hospital combined represent approximately two thirds of this revenue, with the other three study hospitals accounting for the remaining third. Operating revenue was down for all 5 hospitals in 2013 vs. 2012, due primarily to declining inpatient volumes.

As a group, the five hospitals lost nearly $32 Million from operations in 2013. Financial performance is highly variable, however, as the two Barnabas Health hospitals (Clara Maass and Newark Beth Israel) reported positive operating income, while Saint Michael's, East Orange, and University Hospital each had negative operating incomes of ($10 Million) or more for 2013.

Of particular note is the fact that in 2013 the New Jersey Hospital Care Payment Assistance Program (New Jersey's charity care subsidy program) provided $177 Million (26% of the state total) to the five study hospitals. The majority of this subsidy was provided to University Hospital ($101 Million). Without this subsidy, the five hospitals combined for $209 Million in operating losses in 2013. It is also noteworthy that University Hospital's operating results are somewhat understated by the fact that the fringe benefits paid to its employees were absent from the operating expenses in its financial statements. This

represents an additional $90 Million or more annually that has historically not been included in the presentation of UH's financials.

This level of negative aggregate operating performance does not appear to be sustainable in the long term and absent significant changes in the configuration and operation of the facilities, is unlikely to improve given anticipated trends in market volumes, along with increased pressure on reimbursement from payers at all levels (commercial, state, and federal). Financial performance for the five study hospitals in 2013 was, in general, worse than 2012. Both Clara Maass and Newark Beth Israel have maintained positive operating margins. However, the other three study hospitals did not have positive operating margins, and combined, have a negative EBIDA (earnings before interest, depreciation, and amortization), in addition to negative operating incomes. EBIDA can be an important indicator of whether a hospital's operations are sustainable. It removes the non-cash expenses of depreciation and amortization from consideration and as well as the interest owed for debt. A positive EBIDA for a financially struggling hospital suggests that the hospital is, at the very least, generating enough cash from its core operations to pay its bills (excluding interest) and in the event of a debt restructuring or forgiveness, could realistically be financially sustainable over the near-term without the burden of debt repayment. A negative EBIDA, on the other hand, suggests that a hospital is not generating enough financial capacity from its core operations to pay its bills, regardless of any debt forgiveness. Negative EBIDAs suggest that without substantial changes to their expense structures (as revenues have been decreasing) these hospitals risk becoming insolvent.

From a balance sheet perspective, St. Michael's has very high debt levels with a debt to capitalization ratio of more than 100%. A hospital's ratio of debt to capitalization measures its degree of financial leverage. One can think of it as the fraction of a hospital's total assets that has been financed with debt, rather than with the hospital's equity funds (endowments plus accumulated retained earnings). Other things being equal, the higher a hospital's debt-to-capitalization ratio, the larger the interest expense in the hospital's income statement and the larger the total debt-service in its cash flow statement. Therefore, this ratio is widely used by financial analysts to assess the degree to which a hospital is leveraged and thus, may be unable to take on additional debt or the extent to which a hospital may have difficulty meeting its scheduled debt service payments. The other facilities have debt to capitalization ratios within industry standards.

As might be expected from the ongoing negative operating results at St. Michaels, University, and East Orange, days cash on hand is generally low. Days cash on hand is defined as cash and highly liquid assets (e.g., marketable securities or money-market funds) divided by the hospital's average daily cash outflow to support operations; it excludes depreciation, which is a non-cash expense. In other words, days cash on hand measures a hospital's cash reserves in terms of the number of days the hospital could

continue to meet daily operating expenses even if it were to receive no additional cash revenues. The lower the number, the more vulnerable a hospital is to disruptions in revenues (e.g., a slowdown in payment by third-party payers) or expenses (e.g., sharp increases in supply costs). A very low number may signal that the hospital may not be able to meet payroll.

Furthermore, the average age of plant at the five facilities combined is over 18 years, suggesting the hospitals also have deferred capital spending. Average age of plant is a ratio that is calculated by dividing accumulated depreciation by depreciation expense. This ratio measures the average age (in years) of an organization's fixed assets. In general, industry norms are in the 8-12 year range. The lower the value is, the newer a business's buildings and equipment. A low average age typically means that the organization is using current technology and that it will not need to make large capital expenditures in the near future.

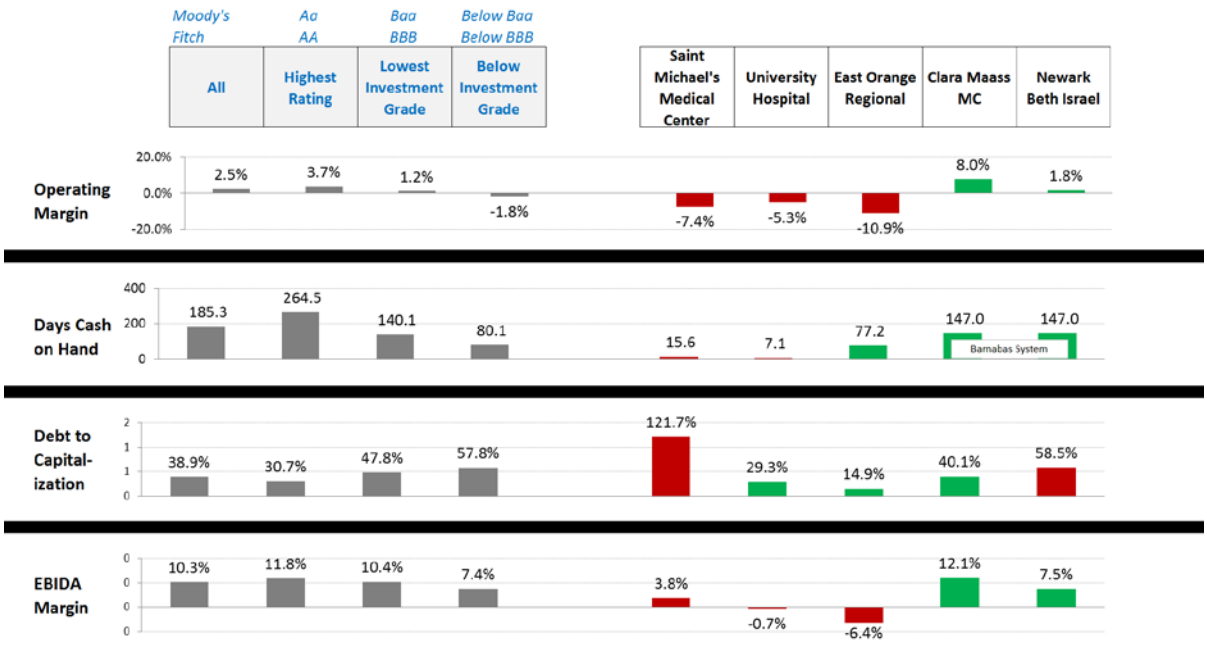
Given the significant challenges these hospitals face – declining volumes and revenues along with continued increases in operating expenses -- recent financial performance (presented in Table 5-18 below and compared to industry benchmark in Table 5-19) suggests that minor improvements to operating performance will not be sufficient to create a sustainable financial future for the Planning Area hospitals.

TABLE 5-18: RECENT FINANCIAL PERFORMANCE OF STUDY HOSPITALS

$$ in millions	Saint Michaels Medical Center		University Hospital		East Orange General Hospital		Clara Maass MC		Newark Beth Israel	
Hospital System	Trinity Health		Independent		Independent		Barnabas		Barnabas	
Year	*CY12*	*CY13*	*FY12*	*FY13*	*CY12*	*CY13*	*CY12*	*CY13*	*CY12*	*CY13*
Operating Revenue	$201.7	$192.3	$492.2	$464.4	$106.7	$99.7	$277.1	$260.9	$583.1	$560.0
Operating Expense	$238.3	$206.6	$486.7	$488.9	$109.5	$110.6	$257.1	$246.7	$569.0	$556.4
Operating Income	($36.5)	($14.3)	$5.5	($24.5)	($2.8)	($10.9)	$20.0	$14.2	$14.1	$3.7
Operating Margin	-18.1%	-7.4%	1.1%	-5.3%	-2.7%	-10.9%	7.2%	5.4%	2.4%	0.7%
EBIDA	($19.8)	$7.3	$24.9	($3.1)	$1.9	($5.6)	$31.7	$25.3	$39.6	$28.7
Total Assets	$190.8	$167.9	$207.4	$263.4	$79.6	$78.0	$154.5	$172.7	$376.8	$355.9
Long Term Debt	$232.2	$227.8	$89.0	$77.3	$14.0	$11.6	$75.5	$69.3	$220.4	$208.4
Debt to Capitalization	72%	122%	43%	29%	18%	15%	49%	40%	59%	59%
Days Cash on Hand	12.2	15.6	0.6	7.1	78.0	77.2	147 (Barnabas System)			
Source notes/ comments	hospital financial statements debt excludes moneys "due to CHE"		hospital financial statements		hospital financial statements		hospital internal data, Medicare cost reports		hospital internal data, Medicare cost reports	

Source: Audited financial statements, internal hospital financials, and Medicare cost reports; Barnabas System days cash from Fitch, November 2013

TABLE 5-19: FINANCIAL PERFORMANCE OF STUDY HOSPITALS COMPARED TO BENCHMARKS



Source: Audited financial statements, internal hospital financials, and Medicare cost reports. Medians from Fitch and Moody's (FY 2012—latest available); Barnabas system days cash from Fitch, November 2013.

TABLE 5-20: CHARITY CARE SUPPORT TO STUDY HOSPITALS

FY13 $$ in Millions

	Operating Revenue	Operating Expense	Operating Income	State Charity Care Subsidy (FY13)	Operating Income without Subsidy
Saint Michaels Medical Center	$192.3	$206.6	($14.3)	$26.0	($40.3)
University Hospital	$464.4	$488.9	($24.5)	$100.7	($125.2)
East Orange General Hospital	$99.7	$110.6	($10.9)	$11.2	($22.1)
Clara Maass MC	$260.9	$246.7	$14.2	$4.4	$9.8
Newark Beth Israel	$560.0	$556.4	$3.7	$34.8	($31.1)
Study Hospitals Total	$1,577.3	$1,609.1	($31.8)	$177.1	($208.9)

State Total $675.0

Source:
http://www.state.nj.us/health/charitycare/documents/sfy2013ccs.pdf

Medical Staff Complement at Study Hospitals

In addition to understanding the operating statistics and trends of the study hospitals, it is also important to profile the physician resources in the Planning Area. We therefore compiled and assessed demographic information on the medical staffs of the study hospitals as part of this engagement. This section of our report provides an overview of the medical staffs of the study hospitals.

Based on a review of the medical staff rosters of the study hospitals, physicians in the Newark area appear to have a traditional practice model, meaning predominance of solo and small independent physicians practices. This is in stark contrast to many other areas of the U.S. where physicians are organized in large (100+) physicians groups and are more closely integrated with or employed by hospitals and health systems.

The proportion of hospital-employed physicians on the Planning Area hospitals' medical staff ranges from less than 1% to 28%. By way of comparison, Medical Group Management Association data indicate that 62% of U.S physicians nationwide were employed by hospitals and health care systems in 2013.[1] Navigant believes the predominance of independent and small practice physicians in the Planning Area is one reason why ALOS is high at the study hospitals (as the schedules of solo physicians may make it more difficult to discharge patients in a timely manner, compared to physicians in group practices).

As the primary teaching affiliate of Rutgers New Jersey Medical School, University Hospital has a "closed" medical staff of ~600 faculty (organized as the Robert Wood Johnson Medical Group faculty practice), where an appointment in the Rutgers New Jersey Medical School is required to provide patient care in University Hospital. However, the faculty can (and does) practice at hospitals other than UH.

Physicians on the medical staff of the Planning Area hospitals have an age profile that is older than the national average. Approximately 45% of the medical staff members at the Planning Area hospitals (for which information was available) are age 55 or older, compared to 46% of physicians in NJ and 34% of physicians nationally.[2] Please note that the data below for EOGH includes only those physicians who also are on other area hospital medical staffs, as EOGH was unable to provide age information on its medical staff.

[1] Medical Group Management Association Physician Compensation and Production Survey, 2014 Report Based on 2013 Data

[2] Physician Characteristics and Distribution in the US 2014 edition (2012 data) published by the American Medical Association

TABLE 5-21: STUDY HOSPITAL MEDICAL STAFF AGE PROFILE

Hospital	% 55+
CMMC	47%
EOGH (overlap staff only)	62%
NBIMC	44%
SMMC	41%
UH	46%
Combined Total	**45%**
NJ (all physicians)	**46%**
U.S. (Patient care physicians)	**34%**

The comparatively older age profile of the study hospital medical staffs, combined with the high percentage of physicians in small group and solo practices, has significant implications for the future delivery of healthcare services in the Planning Area. According to the 2014 Health Leaders Market Overview for Northern New Jersey, "Most physicians in Northern New Jersey work in small practices, limiting their leverage in negotiations with managed care organizations." The most notable exception is the Robert Wood Johnson Medical Group, the multispecialty faculty practice of Rutgers RWJ Medical School, with ~600 physicians. Physicians finishing their training today overwhelmingly seek employment opportunities, as opposed to pursuing solo practice or joining small groups. Several recent studies and surveys have documented this trend, with a recent Merritt Hawkins survey showing that more than 90% of their searches were for employed vs. independent physicians. And the Merritt Hawkins 2015 Final Year Medical Residents Survey indicated that 63% of residents have been approached with job opportunities by hospitals and medical groups 51 or more times. As such, replenishing aging, solo / small group physicians in the Planning Area will become increasingly difficult as newly trained physicians select hospital employment or large group practice settings.

There is only a modest amount of overlap between the medical staffs at NBIMC and CMMC, reflecting the geographic distance between the facilities. On the other hand, there is considerable degree of overlap of EOGH and SMMC physicians with other study hospital medical staffs—45% of EOGH's medical staff and 48% of SMMC's medical staff are on staff at one (or more) of the other study area hospitals. The extent to which physicians serve on more than one medical staff suggests that most physicians in the

Planning Area are not reliant on a single facility for their inpatient work and can more readily transition their inpatient cases between facilities if necessary.

TABLE 5-22: STUDY HOSPITAL MEDICAL STAFF OVERLAP

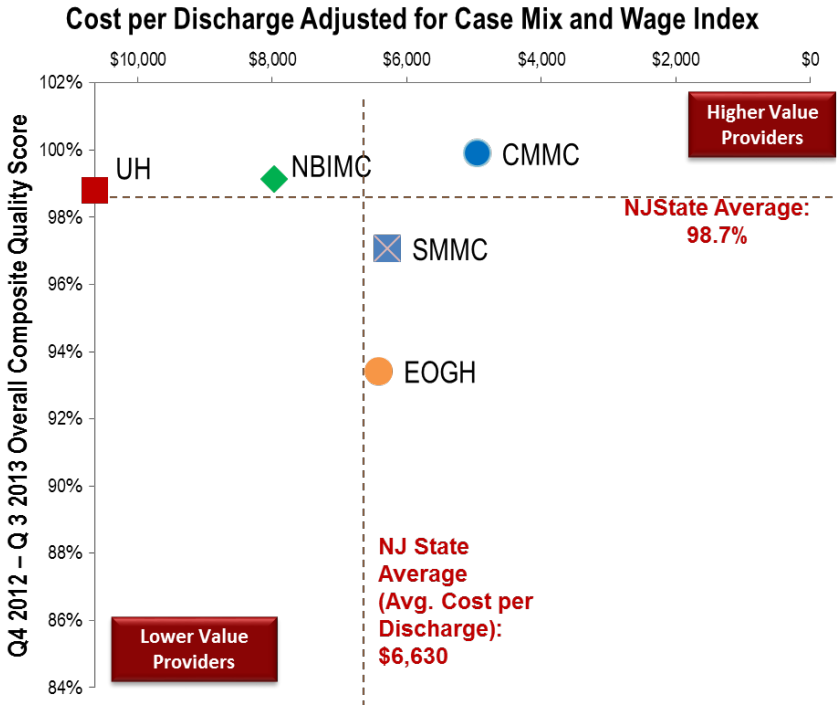
Physician Overlap by Hospital				
Percent	CMMC	EOGH	NBIMC	SMMC
CMMC	-	15%	14%	34%
EOGH	6%	-	13%	16%
NBIMC	15%	34%	-	20%
SMMC	21%	25%	12%	-
Total Overlap	32%	45%	27%	48%
Number	CMMC	EOGH	NBIMC	SMMC
CMMC	-	42	106	148
EOGH	42	-	94	71
NBIMC	106	94	-	89
SMMC	148	71	89	-
Total Overlap	221	125	201	209
Total Staff	700	279	745	439

Comparative Cost, Quality, Patient Satisfaction and Productivity Indicators

We also analyzed data to understand the cost, quality, and patient satisfaction performance of study area hospitals.

When considering overall cost and quality measures, CMMC is the only study hospital that performs better than state averages on both dimensions. While SMMC and EOGH have lower adjusted cost per discharge, they also are below the state average in composite quality scores. NBIMC and UH have quality scores about equal to the state average but significantly higher costs per inpatient discharge. In addition, all five Planning Area hospitals have lower Medicare patient satisfaction scores than the statewide average. With 60% of patients indicating that they are highly satisfied, NBIMC comes closest to the state average of 64%, while EOGH is more than ten percentage points below the state average at 52%.

FIGURE 5-7: COST AND QUALITY COMPARISON OF STUDY HOSPITALS



Source: Hospital Benchmarks and whynotthebest.org. Note: Cost per discharge based on 2013 data for all facilities except SMMC which is based on 2012 data.

TABLE 5-23: STUDY HOSPITAL PATIENT SATISFACTION BASED UPON HOSPITAL CONSUMER ASSESSMENT OF HEALTHCARE PROVIDERS AND SYSTEMS

Hospital	HCAHPS Performance: % of Patients Highly Satisfied (Q4/12-Q3/13)
NBIMC	60%
UH	58%
CMMC	57%
SMMC	57%
EOGH	52%
NJ State Average	**64%**

Section Summary

Decreased demand for inpatient care is resulting in declining volumes for all five of the study hospitals. The study hospitals collectively are operating below industry benchmarks for inpatient occupancy (80-85% for med/surg and 90% for behavioral health) with overall inpatient occupancy at the five study hospitals at 69% in 2013.

Overall, the five study hospitals are struggling financially and are heavily dependent upon the State charity care subsidy for ongoing operations. Given negative volume trends as well as continued downward pressure on reimbursement, financial performance is expected to be challenged even further moving forward. Three of the five study hospitals (EOGH, SMMC, and UH) experienced significant operating losses in 2012 and 2013. The remaining two hospitals, CMMC and NBIMC, both part of Barnabas Health, had positive financial outcomes in 2013, but experienced an erosion in their financial performance compared to 2012.

FQHCs play a vital role in access and healthcare delivery in the Planning Area. It does appear, however, that the coordination of services between the FQHCs and between the FQHCs and other healthcare providers could be enhanced, as there is, for example, often very little coordination between the study hospitals and community resources.

Physicians in the Newark area appear to have a traditional practice model (predominately solo and small practices), which will make addressing population health management

more of a challenge than in other parts of the country, where physicians are organized in large (100+) physician groups and are more closely integrated with or employed by health systems. In addition, the proportion of the study hospital's medical staff over age 55 is high, indicating that physician succession planning and recruitment will be increasingly important—and difficult—given the current predominance of solo and small group practices in the Planning Area.

Section 6 –Findings – Hospital Physical Plants

In order to understand the capability of the existing physical facilities at each of the study hospitals to meet current and potential future patient care needs, we conducted a review of the physical plants of Clara Maass Medical Center, East Orange General Hospital, Newark Beth Israel Medical Center, St. Michael's Medical Center and University Hospital. Each of the five hospitals was assessed to understand current conditions, as well as opportunities and constraints for future use and development. Overall, the average age of plant of the facilities is high and an estimated $400+ million in capital investment is required to bring all five hospitals up to an adequate level of operations.

As part of our assessment of the study hospitals' physical facilities, a team of facility planning experts conducted a tour of each hospital campus and performed a quantitative and qualitative evaluation of the following:

- General condition of each facility,
- General maintenance requirements,
- Planned/approved physical plant renovations/expansion plans,
- Space adequacy by function,
- Flows and adjacencies,
- Needed physical changes to address regulatory and/or operational efficiency imperatives, and
- Potential alternate uses of space.

The team utilized a proprietary facility capacity model to calculate the space sufficiency of the major departments of each of the hospitals in regard to, first, the number of key rooms and, second, the amount of overall space required. The facility team also conducted functional capacity analyses to compare existing capacity with current and future demand for services. In conjunction with the facility tours, our facility planning experts met with representatives from each hospital to review and discuss their physical plant and to ensure a full understanding of any unique circumstances, as well as any plans for future development/renovation.

Methodology

The facility assessment included the following specific tasks:

- **Site Tours:** Each of the five hospitals was toured in detail with hospital representatives to understand the current drivers for clinical areas, such as beds, treatment rooms, operating rooms, procedure rooms, exam rooms and similar areas. Site tours were also used to confirm departmental boundaries, functionality of existing departments and physical conditions.

- **Base Plans:** A diagrammatic plan of each level of the five hospitals was developed and evaluated to further understand appropriateness of adjacencies, flow of patient, visitor and support traffic, and zoning of departmental areas.

- **Area Tabulations:** A table of departmental areas, including overall mechanical/electrical support space, general circulation, building envelope and total building gross area was generated.

- **Facility Assessment:** Based on the tasks outlined above, a Facility Assessment table was developed for each hospital. The Facility Assessment tabulated conditions of each departmental area and was segmented into the following sections: Diagnostic and Treatment Areas, Nursing Units, Support Areas, Administrative/Office Areas, Clinics/Physician Suites, Public Areas, Vacant Space, Mechanical/Electrical Areas, General Circulation and Building Envelope. The actual areas per driver were then compared to Navigant proprietary benchmarks to determine if the total area of each departmental was at, above or below that provided in current best practice facilities. The assessment also evaluated the functionality of each department, looking at issues such as separation of patient and public traffic, adequacy of storage and support spaces, patient privacy and similar considerations. Finally the physical condition of each department was rated.

- **Infrastructure Assessment:** Site components, building envelope, building interiors and mechanical/ electrical systems were assessed based on site tours and an interview of the facility directors at each hospital.

- **Evaluation Ratings:** Evaluation ratings for each department in the Facility Assessment and each component of the Infrastructure Assessment were assigned and were based on the following scale:

  1.0 Poor
  2.0 Marginal
  3.0 Adequate
  4.0 Very Good
  5.0 Optimal

- **Future Bed Need:** Based on demand projections for year 2019 at each hospital, future bed need for medical/surgical, obstetrics, behavioral health and all other inpatient services was projected (observation status beds were also included). Bed need was based on projected average daily census (ADC) at a 90 percent average occupancy target for behavioral health and an 80 percent target for all other areas.

- **Primary Clinical Services Need:** Based on demand projections for year 2019 at each hospital, major clinical service needs were projected. These included projections of future needs for emergency treatment rooms, ambulatory surgery operating rooms, inpatient surgery operating rooms and cardiac catheterization procedure rooms. Needs were based on projected demand divided by Navigant proprietary utilization benchmarks.

- **Planning Models:** Planning models were identified for each hospital site to meet projected facility needs for each scenario. In cases where excess capacity still existed, existing facilities were maintained. In some cases, increased demand could be accommodated by excess capacity in existing facilities with minor renovation. In scenarios where insufficient space existed at a site to accommodate future needs, the area of expansion in square feet was identified.

- **Capital Expense Projections:** Baseline projections included high-level estimates of construction costs to bring existing facilities and infrastructure up to a "3.0 Adequate" level over the next 5 years. In addition, the costs of demolition, site and building restoration, renovation and expansion at each hospital was projected for the reconfiguration scenarios described in the Recommendations section of this report. Total costs were divided by projected baseline expenses to rank hospitals from worst to best physical condition in terms of capital expense per square foot.

At the completion of this task, we developed a summary of our findings regarding the physical plants of the five study hospitals, which follows.

Findings and Conclusions

The five study hospitals will operate 4 million square feet upon completion of the CMMC expansion that is currently underway. Of the total, 463,000 square feet, or 11% of the space, is currently utilized for clinics or physician offices. A very high level benchmark to estimate adequacy of size of the hospital physical plant is area per bed with an industry benchmark of 2,400 to 2,800 square feet depending upon the specific service mix of the hospital. EOGH and CMMC are significantly undersized compared to the benchmark while NBIMC and SMMC are within the industry standard. University Hospital has more physical space than the general industry benchmark would indicate is required. This is not unusual given the unique nature of a primary teaching hospital.

TABLE 6-1: BUILDING AREA SUMMARY

Description (area shown in sq. ft.)	**CMMC**	**NBIMC**	**SMMC**	**EOGH**	**UH**	**Total**
Current Building Area	**610,040**	**1,074,086**	**679,113**	**403,452**	**1,222,233**	**3,988,924**
New Expansion Currently Underway	87,460	0	0	0	0	87,460
Total Area (Including Clinics/Physician)	**697,500**	**1,074,086**	**679,113**	**403,452**	**1,222,233**	**4,076,384**
Clinic/Physician Office Area	48,086	113,911	55,671	71,075	174,268	463,012
Total Area excluding Clinic/Physicians	**649,414**	**960,175**	**623,442**	**332,377**	**1,047,965**	**3,613,372**
Current Beds	317	395	248	207	360	1,527
Area per Current Bed	**2,049**	**2,431**	**2,514**	**1,606**	**2,911**	**2,366**
Benchmark (Area per Bed)	2,400 sq. ft. to 2,800 sq. ft.					

Baseline Capital Expense Projections were made at a high level. This is an estimate of the level of capital investment required over the next five years to bring each of the five facilities to an adequate level in terms of size and infrastructure. Baseline projections are based on square foot estimated construction costs to bring facilities and infrastructure components with a "1.0 Poor" or "2.0 Marginal" rating up to a "3.0 Adequate" rating. In addition to construction costs, projections included other project costs based on a percentage mark-up basis for related expenses such as equipment, furniture, information technology, professional fees, miscellaneous expenses and contingencies. The costs of major medical equipment, financing and property acquisition, if any, are unknown and were not included.

TABLE 6-2: ESTIMATED CAPITAL EXPENDITURE REQUIREMENTS

Baseline	
Clara Maass	$92 Million
Newark Beth Israel	$108 Million
St. Michael's	$57 Million
East Orange	$58 Million
University	$96 Million
Total	**$411 Million**

In total, we estimate that over $400 million in capital expenses are required to bring all of the facilities to an adequate, or 3.0 rating. This is a considerable sum (approximately 25%

of the collective $1.6 billion operating revenue of the 5 study hospitals), especially given that the 5 study hospitals have a cumulative negative operating margin and receive a substantial subsidy from the state.

A summary of findings and conclusions specific to each of the five study hospitals follows.

Findings and Conclusions – Clara Maass Medical Center

The projected baseline capital expense over the next five years to bring the CMMC facilities to an adequate level is $92 Million based on the cost per square foot estimates shown in Table 6-3.

TABLE 6-3: CMMC ASSESSMENT AND ESTIMATED CAPITAL REQUIREMENTS

Facility Assessment						
Diagnostic and Treatment	Nursing Units	Support Areas	Office Areas	Clinics/ Physician Offices	Public Areas	Overall
2.8	2.3	3.3	3.0	3.0	3.0	2.9

Infrastructure Assessment				
Site	Building Envelope	Building Interiors	Infrastructure	Overall
3.1	2.4	2.8	2.7	2.7

Capital Expense (Cost/Sq. Ft.)		
Facility Assessment	Infrastructure Assessment	Overall
$77	$54	$132

Cost per square foot to bring facility to adequate level:		**$132**
Facility square feet:	**x**	**697,500**
Total necessary baseline capital (rounded to nearest million):	**$**	**92,000,000**

The key findings of the assessment were as follows:

- **Diagnostic and Treatment:** Surgery, Emergency, Lab and Imaging departments are constrained in space. Emergency capacity is very tight. The Cancer Center works well.
- **Nursing Units:** Bed towers constructed in 1956, 1990 and 2015 (underway). Unit sizes are constrained. Even after a new 87,640 sq. ft. new expansion, which is currently underway, only 33% of staffed beds will be private, while current best practice is all private beds. The ICU has 15 open bays, but is being replaced. There is not much excess capacity in existing nursing units.
- **Infrastructure:** Main infrastructure needs include new domestic water piping, separation of electrical wiring branches, new exterior paving, new roofs and a second generator.

FIGURE 6-1: CMMC AERIAL VIEW OF CAMPUS

Findings and Conclusions – East Orange General Hospital

East Orange General Hospital has the most significant challenges of the five hospitals in terms of quality and adequacy of the current facilities. The projected baseline capital expense over the next five years to bring the EOGH facilities to an adequate level is $58 Million based upon the costs per square foot estimates shown in Table 6-4, which is fourth of the five study hospitals. Although the physical plant requires the greatest infrastructure investment on a per square footage basis, the total expenditure required is less than several other hospitals due to the small size of EOGH.

TABLE 6-4: EOGH ASSESSMENT AND ESTIMATED CAPITAL REQUIREMENTS

Facility Assessment						
Diagnostic and Treatment	Nursing Units	Support Areas	Office Areas	Clinics/ Physician Offices	Public Areas	Overall
2.5	1.6	2.9	2.9	2.6	2.1	2.3

Infrastructure Assessment				
Site	Building Envelope	Building Interiors	Infrastructure	Overall
3.6	3.1	2.5	3.0	3.1

Capital Expense (Cost/Sq. Ft.)		
Facility Assessment	Infrastructure Assessment	Overall
$107	$37	$144

Cost per square foot to bring facility to adequate level:		$144
Facility square feet:	x	$403,452
Total necessary baseline capital (rounded to nearest million):	$	58,000,000

The key findings of the assessment were as follows:

- **Diagnostic and Treatment:** Emergency and Surgery capacities are adequate but facilities require upgrade. The Emergency Department has mostly open cubicles, which is not best practice and the department is significantly undersized.
- **Nursing Units:** Main tower was built in 1971. All units except Behavioral Health require upgrade. Only 14% of staffed beds are private, which is not best practice.

There is significant excess capacity. The ICU has open bays and does not provide privacy or best practice facilities.

- **Infrastructure:** Primary infrastructure needs include 50% new roofs, 50% new windows, major heating and ventilation upgrades and upgrades for elevators and fire alarm system.

FIGURE 6-2: EOGH AERIAL VIEW OF CAMPUS

Findings and Conclusions – Newark Beth Israel Medical Center

The projected baseline capital expense over the next five years to bring the NBIMC facilities to an adequate level is $108 Million based on cost per foot estimates shown in Table 6-5, which is the largest of the five study hospitals due to its large relative size.

TABLE 6-5: NBIMC ASSESSMENT AND ESTIMATED CAPITAL REQUIREMENTS

Facility Assessment						
Diagnostic and Treatment	Nursing Units	Support Areas	Office Areas	Clinics/ Physician Offices	Public Areas	Overall
3.0	2.2	2.9	2.9	2.7	2.6	2.7

Infrastructure Assessment				
Site	Building Envelope	Building Interiors	Infrastructure	Overall
2.7	2.6	3.0	3.1	2.9

Capital Expense (Cost/Sq. Ft.)		
Facility Assessment	Infrastructure Assessment	Overall
$55	$46	$101

Cost per square foot to bring facility to adequate level:		**$101**
Facility square feet:	x	**1,074,086**
Total necessary baseline capital (rounded to nearest million):		**$ 108,000,000**

The key findings of the assessment were as follows:

- **Diagnostic and Treatment:** Emergency capacity is adequate but facilities are fragmented and require upgrade. Surgery facilities are adequate. Cancer Center access is not optimum but facility is in good condition.
- **Nursing Units:** The main bed tower was constructed in 1975. Most units require upgrade. Only 41% of staffed beds are private. NICU is congested and lacks privacy. ICU works well. Overall capacity is adequate.
- **Infrastructure:** Primary infrastructure needs include new exterior paving, new roofs, ACM abatement, additional fire sprinklers, HVAC upgrades and separation of electrical wiring branches. The Medical Center has targeted future green energy upgrades.

FIGURE 6-3: NBIMC AERIAL VIEW OF CAMPUS

Findings and Conclusions – St. Michael's Medical Center

The projected baseline capital expense over the next five years to bring the SMMC facilities to an adequate level is $57 Million based upon the cost per square foot estimates shown in Table 6-6, which is the lowest of the five study hospitals as significant investments that have been made in recent years.

TABLE 6-6: SMMC ASSESSMENT AND ESTIMATED CAPITAL REQUIREMENTS

Facility Assessment						
Diagnostic and Treatment	Nursing Units	Support Areas	Office Areas	Clinics/ Physician Offices	Public Areas	Overall
3.2	1.5	3.3	3.0	2.7	3.6	2.8

Infrastructure Assessment				
Site	Building Envelope	Building Interiors	Infrastructure	Overall
3.8	3.0	3.1	3.5	3.4

Capital Expense (Cost/Sq. Ft.)		
Facility Assessment	Infrastructure Assessment	Overall
$57	$27	$84

Cost per square foot to bring facility to adequate level:		$84
Facility square feet:	x	679,113
Total necessary baseline capital (rounded to nearest million):	$	57,000,000

The key findings of the assessment were as follows:

- **Diagnostic and Treatment:** Emergency capacity is adequate and Emergency facilities are new. Surgery capacity and condition is adequate. The catheterization Lab suite is significantly oversized (i.e., 6 procedure rooms existing vs. 2 procedure rooms required). The Cancer Center is easily accessible and in very good condition.
- **Nursing Units:** Main bed tower built 1983. All units except Behavioral Health require upgrade. Only 21% of staffed beds are private. Significant excess capacity exists and the facility is oversized for the demand served. Cardiac Care Recovery unit does not provide privacy.
- **Infrastructure:** Primary infrastructure needs include new cooling towers, air handlers, chiller and generator. Older wing has been acquired by a developer for housing and was not included in analysis.

FIGURE 6-4: SMMC AERIAL VIEW OF CAMPUS

University Hospital appears to be in the best condition of the five hospitals in terms of quality and adequacy of the current facilities. The projected baseline capital expense over the next five years to bring the UH facilities to an adequate level is $96 Million based upon the cost per square foot estimates shown in Table 6-7, which is the second highest of the five study hospitals in spite of its better condition relative to the other study hospitals. This is primarily because University is the largest facility.

TABLE 6-7: UH ASSESSMENT AND ESTIMATED CAPITAL REQUIREMENTS

Facility Assessment						
Diagnostic and Treatment	Nursing Units	Support Areas	Office Areas	Clinics/ Physician Offices	Public Areas	Overall
3.0	2.0	3.0	3.0	3.0	2.9	2.8

Infrastructure Assessment				
Site	Building Envelope	Building Interiors	Infrastructure	Overall
4.2	3.4	3.0	3.4	3.5

Capital Expense (Cost/Sq. Ft.)		
Facility Assessment	Infrastructure Assessment	Overall
$54	$25	$79

Cost per square foot to bring facility to adequate level:		**$79**
Facility square feet:	**x**	**1,222,233**
Total necessary baseline capital (rounded to nearest million):	**$**	**96,000,000**

The key findings of the assessment were as follows:

- **Diagnostic and Treatment:** Emergency and Surgery facilities are in good condition but capacities are tight in both areas.
- **Nursing Units:** Main bed tower built 1979. All units require upgrade; 63% of staffed beds are private; some excess capacity exists. Overall building area per bed is high.
- **Infrastructure:** Primary infrastructure needs include major upgrade of emergency power system, new roofs, additional fire sprinklers, and upgraded ventilation.

FIGURE 6-5: UH AERIAL VIEW OF CAMPUS

Section 7—Hospital Bed Need and Emergency Department Demand

This step of the project entailed utilizing the results of the preceding tasks to project future demand for inpatient beds and emergency department services. The future demand was compared to current supply to identify duplicative services and unused capacity as well as any lack of sufficiency of necessary healthcare services in the Planning Area.

We analyzed population projections for the Planning Area and Planning Area residents' utilization of inpatient services to project the demand for these services in the future and then compared the projections with the current supply of beds. The purpose of this analysis was to quantify the bed need, compare it to the current and planned number of available beds, and to evaluate the capacity among Planning Area hospitals to accommodate additional patients. We also projected Planning Area residents' demand for emergency department services.

The initial activity in this task was to calculate current and projected ***demand*** for hospital services in the Planning Area. These projections were developed using generally accepted health planning methodologies, including age-adjusted population-base use rates. In addition, we utilized Navigant Consulting's proprietary projection model to incorporate the impact of national trends and the anticipated medical advancements on future demand and delivery of healthcare services. Navigant's model incorporates local utilization rates and expected changes in those rates due to science and technological changes and is customized to the particular market and organization. We considered local, State, and national trends as we projected demand for services that reflect expected changes in use rates, with the projections extending five years.

After reviewing the projected demand for services with the Authority, we analyzed the projected demand vis-à-vis existing capacity as identified in the inventory of services to determine whether duplicative or unused/under-used capacity exists. This assessment compared current capacity with both current and projected demand and also incorporated patient migration patterns (residents of the service area leaving the area to receive care elsewhere and patients using services in the service area who live outside the service area) as well as market share trends by hospital and service to determine any necessary adjustments to the demand projections.

In addition to determining whether duplicative or unused/under-used capacity or insufficiency of services exists in the Planning Area, our analysis also considered whether there were any current or projected ***shortages or unmet needs*** in the Planning Area.

Inpatient Bed Projection Methodology

Navigant projected Planning Area residents' demand for inpatient hospital services over the next five years based on 2013 use-rates calculated at the Diagnosis-Related Group (DRG) level for each of five age groupings: 0 – 17, 18 – 44, 45 – 64, 65 – 84 and 85 and over. Critical assumptions in projecting future demand include migration patterns, utilization rates, market shares, and ALOS.

We initially considered three potential scenarios for future utilization rates:

1. Planning Area hospital admission rate continues to decrease at a rate consistent with or similar to declines over the previous three years.

2. Planning Area hospital admission rate trends downward, approximately to the New Jersey State utilization rate in five years (by 2018)

3. Planning Area hospital admission rates trends downward, approximately to the U.S. average by 2018.

Scenario number 2, New Jersey State utilization rates by 2018 results in the slowest rate of decline and is therefore the most conservative with regard to ensuring an adequate bed supply in the Planning Area. Therefore, this scenario was used for the study projections. The utilization rate for each DRG and age group was projected to decrease to the 2013 New Jersey Statewide average by 2018.

TABLE 7-1: FUTURE UTILIZATION SCENARIOS

	Projected Inpatient Utilization Rates in the Planning Area - Discharges per 1,000 Population								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Planning Area Historical	133.5	129.1	120.8						
Scenario 1: Continue Recent Declines				117.2	113.7	110.3	106.9	103.7	100.6
Scenario 2: Approach NJ State Utilization				119.4	118.0	116.6	115.2	113.8	112.4
Scenario 3: Approach USA National Utilization				118.4	116.1	113.7	111.4	109.0	106.6

Similarly, we reviewed Planning Area, New Jersey, and U.S. trends in average length of hospital stay. The average time Planning Area residents spend in the hospital is higher than both the New Jersey and U.S. averages as shown in Table 7-2.

TABLE 7-2: HISTORICAL LENGTH OF STAY TRENDS

Geography	2011	2012	2013	CAGR ('11-'13)
Planning Area Residents	5.73	5.80	5.86	*0.9%*
New Jersey Overall	5.15	5.14	5.20	*2.0%*
United States	5.20	5.20	5.30	*1.0%*

Source: New Jersey Department of Health State discharge databases; American Hospital Association Statistics Guide 2015.
Note 1: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.
Note 2: ALOS numbers for United States are based on Nongovernment not-for-profit

Given 2011 through 2013 ALOS trends, physician organization in the area, and community health needs of the Planning Area population, the ALOS is assumed to remain constant through the 2019 projection period. If length of stay decreases, i.e., moves closer to the New Jersey Statewide (which is the same as the U.S.) average, the demand for inpatient beds will decrease beyond the reduction projected in this study.

The projections include Planning Area total bed need and bed need for the five study hospitals based on 2013 market share, i.e., the individual hospitals' respective market shares remain at 2013 levels through 2019. The bed need assumes a targeted 80 percent occupancy for medical/surgical (med/surg) and obstetrics patients and a targeted 90 percent occupancy for behavioral services.

Inpatient Bed Planning Area Projection Results

The analysis indicates that Planning Area residents required 1,481 beds of all types in 2013 and the need will decrease to 1,401 beds in 2019 for medical surgical, obstetrics and behavioral health services, a 5.4% decline.

TABLE 7-3: TOTAL BED NEED FOR PLANNING AREA RESIDENTS

	2013	2014	2015	2016	2017	2018	2019	*Comment*
Total Planning Area Discharges - All Residents								
Med/Surg	56,480	56,136	55,765	55,408	55,065	54,737	54,528	
Obstetrics	9,824	9,745	9,667	9,590	9,513	9,437	9,362	
Neonatology	3,015	2,991	2,967	2,943	2,920	2,896	2,873	
Behavioral	7,443	7,145	6,859	6,585	6,322	6,069	5,826	
Total	**76,762**	**76,017**	**75,259**	**74,526**	**73,820**	**73,139**	**72,589**	
Total Planning Area Census - All Residents								
Med/Surg	893	889	884	879	874	870	867	*Constant ALOS*
Obstetrics	80	79	78	78	77	76	76	*Constant ALOS*
Neonatology	73	73	72	72	71	71	70	*Constant ALOS*
Behavioral	156	150	144	138	133	127	122	*Constant ALOS*
Total	**1,202**	**1,191**	**1,178**	**1,166**	**1,155**	**1,144**	**1,135**	
Total Planning Area Bed Need								
Med/Surg	1,116	1,111	1,105	1,098	1,093	1,087	1,083	*80% Occupancy*
Obstetrics	99	99	98	97	96	95	95	*80% Occupancy*
Neonatology	92	91	90	90	89	88	87	*80% Occupancy*
Behavioral	174	167	160	154	147	142	136	*90% Occupancy*
Total	**1,481**	**1,467**	**1,453**	**1,439**	**1,425**	**1,412**	**1,401**	

Note: Excludes Normal Newborn

Study Hospitals Baseline Inpatient Bed Need

We made two adjustments to the population-based total Planning Area projected demand presented above to determine the number of hospital beds needed in the study hospitals to meet the projected demand. We adjusted the population-based projected demand for the level of out-migration by Planning Area residents to other hospitals in New Jersey and New York observed in 2013. We also adjusted the population-based projected demand for the level of in-migration to Planning Area hospitals by residents of other parts of New Jersey and other states observed in 2013.

Because there is net out-migration of patients from the Planning Area, (i.e., the number of patients who reside in the Planning Area admitted to hospitals other than the five study hospitals (out-migration) exceeds the number of patients who reside outside of the Planning Area admitted to the study hospitals (in-migration)), the inpatient census and bed need for the five study hospitals combined is lower and is projected to remain lower than that of the Planning Area overall.

The number of beds needed at the five study hospitals was determined by applying 2013 market share to the Planning Area demand projection, i.e., market share was held constant and there are no changes in net migration. Given the decline in the study hospitals' market share over the last several years, holding market share constant is an optimistic assumption. Continued decline in market share would result in a need for fewer beds than in our projections.

TABLE 7-4: OVERALL BED NEED AT FIVE STUDY HOSPITALS

Study Hospital Demand	2013	2019 Projected Baseline
Inpatient Discharges	66,554	62,959
Average Daily Census	1,027	972
Bed Need at Target Occupancy Rates	1,271	1,208
Available Beds	1,495	1,527
2013 Licensed Beds	2,093	2,093
Bed Need/(Surplus) based on available beds	**(224)**	**(319)**

Note: Excludes normal newborn and neonatal

As such, there is an overall projected surplus of 319 beds in 2019 including excess capacity in medical/surgical (med/surg) and behavioral beds. Current supply more closely matches demand for obstetrics beds. The greatest surplus will be in med/surg with 251 beds more than required in 2019 as shown in Table 7-5 below.

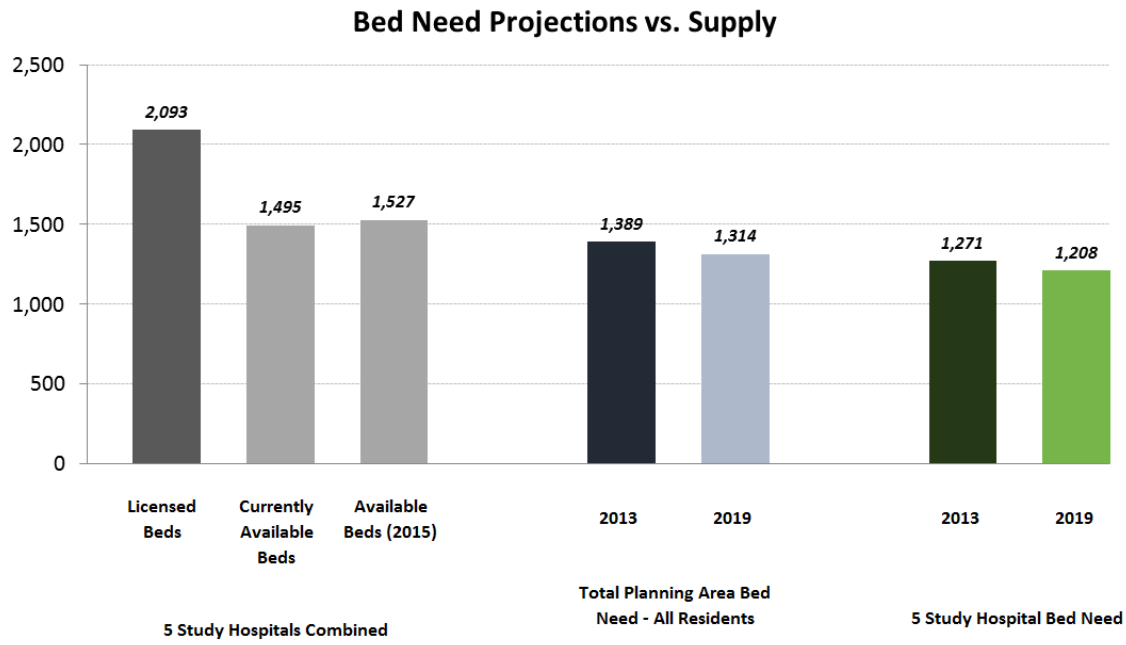
TABLE 7-5: STUDY HOSPITAL BED NEED BY TYPE

Description	2013		2019		Licensed Beds	Baseline Available Beds	2019 Shortage / (Surplus) Available Beds
	ADC	Bed Need	ADC	Bed Need			
Med/Surg	840	1,051	815	1,023	1,805	1,274	(251)
Obstetrics	56	72	54	68	89	76	(8)
Behavioral	132	148	103	117	199	177	(60)
Totals	**1,027**	**1,271**	**972**	**1,208**	**2,093**	**1,527**	**(319)**

Note: Excludes normal newborn and neonatal

Figure 7-1 below summarizes information from Tables 7-3 to 7-5, comparing current bed supply to current and future bed need for Planning Area residents and for the 5 study hospitals. As indicated in Table 7-4, there is expected to be a surplus of 319 beds at Planning Area hospitals by 2019 (1,527 available beds minus 1,208 target bed need).

FIGURE 7-1: PLANNING AREA AND STUDY HOSPITAL BED NEED COMPARED TO CURRENT SUPPLY (EXCLUDES ALL NEWBORNS, INCLUDES OBSERVATION VOLUME)



Note: Excludes normal newborn and neonatal

This excess capacity, coupled with the challenged financial performance of the study hospitals in aggregate, indicates that continuation of the current state and configuration of hospital services in the Planning Area will make efficiently and effectively meeting the healthcare needs of Planning Area residents increasingly challenging, if not impossible. Reconfiguration of services in the Planning Area appears warranted in order to reduce unneeded capacity and improve the ability of the providers to more efficiently and effectively serve the needs of area residents.

Duplication of Services

In addition to an overall surplus of beds, there is also duplication of services among the five Planning Area hospitals. As noted previously, some service rationalization has already occurred as EOGH and SMMC do not provide obstetrics services. NBIMC currently maintains 57 Level III neonatal intensive care unit (NICU) bassinets and UH currently maintains 5 Level III NICU bassinets. NICU services are an area where duplication is very expensive due to the high cost to provide a full range of pediatric subspecialty services.

Two of the three study hospitals provide cardiac surgery at volume levels that are lower than recommended to maintain physician and staff competency. St. Michaels and University Hospital are relatively low volume programs with 127 and 61 discharges respectively in 2013. Only NBIMC has cardiac surgery volume that would support a sustainable, high-quality program. The duplication in cardiac surgery is especially noteworthy because the low (current and projected) volume precludes more than one of the Planning Area hospitals from achieving critical mass in this service. Industry standards developed by the Leapfrog Group include a recommended annual hospital volume of 450 or more coronary artery bypass grafts.[3]

[3] Leapfrog Group Evidence-based Hospital Referral (EBHR) Fact Sheet, "Evidence Based Hospital Referral," March 21, 2011;

TABLE 7-6: STUDY HOSPITAL CARDIAC SURGERY VOLUMES

Cardiac Surgery Volumes in 2013	
St. Michael's Medical Center	127 discharges
University Hospital	61 discharges
Newark Beth Israel Medical Center	678 discharges

Source: Data received from SMMC, UH, NBIMC

Emergency Department Volume and Demand

The study hospitals each have active emergency departments (ED) with a total of 325,370 ED visits across the five study hospitals in 2013, with individual volumes ranging from a low of 34,000 to a high of 96,000. Approximately 16% of those visits (52,000) resulted in an inpatient admission. This is higher than the U.S. average of 12% (according to the National Hospital Ambulatory Medical Care Survey), which may reflect the lack of sufficient preventive, primary care and/or the health status of the population in the Planning Area.

TABLE 7-7: STUDY HOSPITALS EMERGENCY VISITS

2013 Emergency Department Visits

Hospital	Number	Percent
CMMC		
Patient admitted as inpatient	12,317	16%
Patient discharged as outpatient	63,838	84%
Total ED visits	**76,155**	
NBIMC		
Patient admitted as inpatient	12,775	15%
Patient discharged as outpatient	70,384	85%
Total ED visits	**83,159**	
SMMC		
Patient admitted as inpatient	6,470	18%
Patient discharged as outpatient	29,474	82%
Total ED visits	**35,944**	
EOGH		
Patient admitted as inpatient	6,398	19%
Patient discharged as outpatient	27,644	81%
Total ED visits	**34,042**	
UH		
Patient admitted as inpatient	13,910	14%
Patient discharged as outpatient	82,160	86%
Total ED visits	**96,070**	
Total		
Patient admitted as inpatient	51,870	16%
Patient discharged as outpatient	273,500	84%
Total ED visits	**325,370**	

Source: Data received from study hospitals

Emergency Department Capacity Needed

Future ED visit projections were developed with a two-pronged approach due to the distinction between ED visits resulting in an inpatient hospital admission and ED patients discharged from the Emergency Department. ED visits resulting in an inpatient admission are projected to follow the downward utilization projected for inpatient admissions. Outpatient ED visit projections were developed by applying Truven projected market trends to the projected population. Truven Health Analytics is the healthcare industry leader in projecting future volumes for outpatient health care services based on industry trends and the impact of future technology.

Table 7-8 below shows the demand for emergency visits in the study hospitals including emergency department visits by patients admitted as inpatients and outpatient emergency department visits to obtain total visits for purposes of estimating the number of emergency department exam rooms/bays needed for the future. The study hospitals are projected to serve 339,000 ED visits in 2019 in the baseline scenario, which assumes all five hospitals remain as full service inpatient facilities.

Assuming an exam room/bay capacity level of 1,700 visits per room or bay per year, the estimated number of emergency department rooms/bays needed to meet projected demand is 202 in 2019. Current ED capacity is fairly closely aligned with 2019 demand at CMMC, EOGH, and UH. NBIMC and SMMC have excess ED capacity. However, no one hospital has current capacity to fully absorb the ED activity from another of the study hospitals.

TABLE 7- 8 EMERGENCY DEPARTMENT DEMAND

Hospital	2013 Volume	2019 Projected Demand	Current Quantity	Annual Utilization Benchmark	2019 Rooms Required	Variance
CMMC	76,155	78,957	48	1,700	47	1
NBIMC	83,159	86,245	61	1,700	51	10
SMMC	35,944	37,800	40	1,700	23	17
EOGH	34,042	35,200	23	1,700	21	2
UH	96,070	101,031	61	1,700	60	1
Total	**325,370**	**339,233**	**233**	**1,700**	**202**	**31**

Section 8—Conclusions

This section of the report includes key conclusions developed based upon the Planning Area's demographic profile, migration patterns, healthcare resources, recent trends, current capacity and facility configuration of the study hospitals, as well as expected future demand in the region. The 10 major conclusions summarized below form the foundational basis for the recommendations presented later in this report.

1. **Current and Growing Excess Inpatient Capacity:** Analysis of the need for and utilization of services in the Planning Area leads us to conclude there is currently excess inpatient capacity in every inpatient bed type (pediatrics, obstetrics, psychiatry, and medical/surgical); furthermore, this surplus is expected to increase in the future. The current supply of available beds (1,495) will increase to 1,527 with the opening of the new 32-bed unit at CMMC. Current ADC of 1,027 (excluding newborn volume, but including observation stays) is projected to ***decrease*** to approximately 970 by 2019 due to the modest population growth in the Planning Area and continued declines in inpatient use rates, with the result being that the existing surplus of beds will grow from 224 to almost 320.

2. **Significant Historical Trend of Hospital Closures:** Since 1999, six hospitals in the Planning Area have closed. And while those hospital closures (along with others in the Newark Union Metropolitan Statistical Area) benefited the study hospitals by generating some additional volume, those added volumes have not been sufficient to significantly reduce the excess capacity or duplication of services in the Planning Area. Given the extent of overcapacity in the Planning Area, it is almost certain that individual attempts to "right-size" by each of the five study hospitals would be insufficient to fully align area capacity with demand, especially in the future, as inpatient demand is expected to continue to decline.

3. **Significant Duplication and Few Unique Services:** In addition to the significant surplus of inpatient beds, there appears to be substantial duplication of services and relatively few unique services in the Planning Area. All five study hospitals provide inpatient medical/surgical, behavioral health, and emergency services. Three of the study hospitals offer cardiac surgery and 3 operate obstetrics and inpatient pediatrics programs. Two of the hospitals perform organ transplants. In addition, the Planning Area is home to 3 FQHCs, each of which provides a generally similar set of services. EOGH does have the only forensic unit in the Planning Area. The unit contains 17 beds, but maintained an ADC of only 5.2 in 2013 (an average occupancy of 31%).

4. **Large and Growing Financial Challenges, Even with Significant State Subsidy:** It is clear that continuation of the status quo will require continued significant (and

likely increased) ongoing financial subsidy from the State of New Jersey. As a group, the five hospitals lost nearly $32 Million from operations in 2013. However, the New Jersey Hospital Care Payment Assistance Program (New Jersey's charity care subsidy program) provided $177 Million (26% of the state total) to the study hospitals. Without this subsidy, the five study hospitals generated $209 Million in operating losses on a combined basis in 2013. Both EOGH and UH saw a further deterioration in their financial performance between 2012 and 2013. While the two Barnabas Health hospitals (CMMC and NBIMC) achieved a positive operating margin in 2013, they saw significant degradation from 2012 operating levels. There was some progress at SMMC between 2012 and 2013, however, it has not succeeded in "turning the corner" in terms of financial performance. Therefore, it is clear that continuation of the status quo is not a viable or appropriate option in terms of financial performance, clinical efficacy, or positioning the study organizations to effectively manage and improve the health of Planning Area residents.

5. **Low Volumes Impede Clinical Quality and Efficiency in Certain Services:** Continuation of the status quo will significantly impede the hospitals' ability to generate the "critical mass" of patient volumes necessary to achieve clinical efficacy in key specialized services. For example, industry standards developed by the Leapfrog Group recommend an annual hospital volume of 450 or more coronary artery bypass grafts. And many state certificate of need regulations require at least 300 coronary artery bypass crafts as the minimum threshold to have an economically viable and clinically efficacious program. Yet two of the three cardiac programs in the Planning Area (SMMC and UH) performed less than 200 procedures ***combined***.

6. **Aging Facilities with Significant Capital Needs:** While recent capital expenditures at the five hospitals in aggregate appear to have kept pace with depreciation, the average age of plant at the five facilities suggests this has not been the case historically. The study hospitals' average age of plant is over 18 years, compared to the Fitch median of 10.6 years. And in fact, analysis of the study hospital facilities indicates that all five study hospitals require substantial capital investment to address pressing needs, with an estimated total of $411 Million in capital required for upgrades and renovations to get all five facilities to a rating of "adequate." While an investment of that magnitude would likely have a positive short-term economic impact on Newark in terms of construction jobs, the ability of the study hospitals to afford this level of investment is highly questionable. In addition, because the expenditures would be undertaken by the individual entities (or their sponsoring organizations) with little to no coordination, a combined expenditure of this amount would almost certainly

perpetuate and potentially exacerbate the existing excess capacity and duplication of services in the Planning Area.

7. **Aging, Unorganized Physician Sector:** Physicians on staff at the Planning Area hospitals have a higher average age than nationally and their practice model (excluding the Rutgers faculty) is predominately solo and small group practices. This combination of an older age profile and a traditional practice mode will make replacing Planning Area physicians who retire or otherwise leave practice increasingly difficult, given that newly trained physicians are choosing hospital employment or large group practice settings. Furthermore, the traditional practice mode of Planning Area physicians will make addressing population health management more of a challenge than in other parts of the country, where physicians are organized in large (100+) physician groups and are more closely integrated with or employed by hospitals and health systems, which facilitates tackling the challenges of population health management.

8. **Few Off-Campus Ambulatory Services, Other than FQHCs:** There appears to be a high degree of fragmentation in the organization and delivery of healthcare services in the Planning Area as evidenced by the significant and increasing excess inpatient bed capacity and the comparative paucity of accessible, appropriately distributed ambulatory care facilities in the Planning Area. And while the three FQHCs in the Planning Area play a vital role in providing residents with access to affordable healthcare services, it appears a higher level of service coordination and integration between the FQHCs themselves and between the FQHCs and other healthcare service providers will be necessary to position Planning Area healthcare providers to effectively manage—and improve—the health of Planning Area residents.

9. **Mostly Informal Connectivity with Post-Acute Providers:** The relationships of the study hospitals with post-acute care providers in the area appear to be largely informal rather than part of a formalized, coordinated network of care. While in-depth analysis of those relationships was beyond the scope of this study, development of more integrated, coordinated networks spanning the continuum of care could help enhance discharge transitions from acute care facilities. This could, in turn, help acute care providers better manage length of stay. In this regard, conversion of excess capacity at Broadway House to general post-acute care would provide an opportunity for Broadway House to work closely with the study hospitals to enhance discharge transitions from acute care and is a positive development.

10. **Potential Change in Ownership Not a Solution to Regional Challenges:** Two of the study hospitals (EOGH and SMMC) are currently pursuing potential change of ownership transactions. Based on our analysis of the Planning Area, it is unclear

how the transfer of the assets of any of the study hospitals through a sale to another party would resolve the underlying overcapacity and unnecessary service duplication in the Planning Area. Rather, any such transaction would seem more likely to perpetuate the status quo than to facilitate the redeployment / transformation of resources to align capacity with need in the Planning Area. Transferring the assets of one or both of these hospitals would perpetuate—and probably intensify—the competition for the decreasing number of inpatients in the Planning Area. Nor would transferring the assets through a sale help address the current degree of fragmentation of the healthcare delivery system in the market. And a sale of one or both of the facilities would be unlikely to facilitate the organization of physicians. In effect, sale of one or both hospitals would appear to continue the status quo, which would not address the excess capacity and unnecessary duplication of services.

Section 9—Recommendations

This section of our report presents the recommendations we developed to address the duplication of services and the unused capacity identified in the Planning Area. These recommendations are based on the conclusions summarized in the previous section and a set of Guiding Principles we developed as "touchstones" to frame the recommendations, which appear in this section. In addition, we identified several initiatives that we believe would be appropriate to implement regardless of other circumstances or conditions. These "no regret" initiatives are summarized in this section, as are the various options or scenarios we evaluated as part of the development of the recommendations.

As noted in the Introduction (Section 1) to this report, it is vitally important to recognize the strategic context in which this study was conducted: the healthcare delivery system in the U.S. is experiencing a period of unprecedented change that is transforming not just how healthcare is financed, but how it is organized and delivered. Success in the future healthcare environment will require fundamentally different approaches, skills, and strategies than in previous periods. As a result of this ongoing transformation, we developed the recommendations for the Planning Area to address the emerging healthcare environment rather than the environment of the past.

Guiding Principles

Based upon the direction provided by the Authority, as well as our analysis of the Planning Area's healthcare requirements, healthcare trends, the population's needs, and current financial and physical condition of the five study hospitals, we developed (and reviewed with the Authority) a series of Guiding Principles to frame the recommendations. We used these Guiding Principles to help assess potential options for addressing the duplication of services and unused capacity in the Planning Area. While the Guiding Principles relate specifically to the Planning Area, they also take into consideration the context of overall healthcare trends in New Jersey as well as nationally.

The Guiding Principles address both the public policy issues of providing Planning Area residents with adequate access to high-quality, affordable healthcare services and the need to mitigate the significant expenditure by the State of New Jersey in subsidizing the hospital organizations delivering those services. The Guiding Principles include the following:

1. Align the supply of beds with the current and future need of the Planning Area population for beds.

2. Improve the clinical quality, operational efficiency, and financial performance of services provided.

3. Enhance the ability to recruit and retain an appropriate complement of high-quality physicians, clinical staff, and support personnel.

4. Invest in initiatives that represent the optimal use of capital over the longer term (i.e., five years and beyond).

5. Minimize dependence on State operating subsidies.

6. Enhance the area healthcare providers' ability to manage population health.

In addition to the above Guiding Principles, our recommendations on how to address the healthcare delivery configuration in the Planning Area also took into consideration the State's commitment to healthcare and medical education as outlined in the Newark Agreements of 1968 and the New Jersey Medical and Health Sciences Restructuring Act of 2013. This includes establishing methods of support for the mission of University Hospital and Rutgers-Newark Biomedical and Health Sciences schools that will minimize need for subsidization.

The Newark Agreements of 1968 included commitments to the City of Newark to retain a University Hospital in downtown Newark. The agreement included development of 58 acres for the health campus including a comprehensive community health services program and additional land committed to development. The University of Medicine and Dentistry of New Jersey ("UMDNJ") and the Newark Community Health Council were tasked with developing comprehensive health and mental health plans for the low-income community and expanding the training and recruitment of minority students, faculty and staff.

The New Jersey Medical and Health Sciences Education Restructuring Act (NJMHSERA), which became effective on July 1, 2013, reshaped the landscape of medical education and teaching hospitals in Newark. NJMHSERA established Rowan University as the State's newest comprehensive research university, and integrated the UMDNJ School of Osteopathic Medicine with Rowan. The remainder of UMDNJ, with the exception of University Hospital in Newark, was integrated with Rutgers University. University Hospital continues to be the primary teaching hospital for the Rutgers New Jersey Medical School, the New Jersey Dental School (Rutgers School of Dental Medicine) and any other Newark-based medical education programs.

University Hospital became a separate public, non-profit, legal entity governed by an 11-member Board of Directors. The Board of Directors includes four ex officio members (the Deans of the Rutgers New Jersey Medical School, and the New Jersey Dental School, the President of Rutgers University and the Chancellor of Rutgers Biomedical and Health

Sciences) and seven members appointed by the Governor. The Board of Directors has the power to enter into a contract with a nonprofit hospital corporation to manage or assist in the management of University Hospital

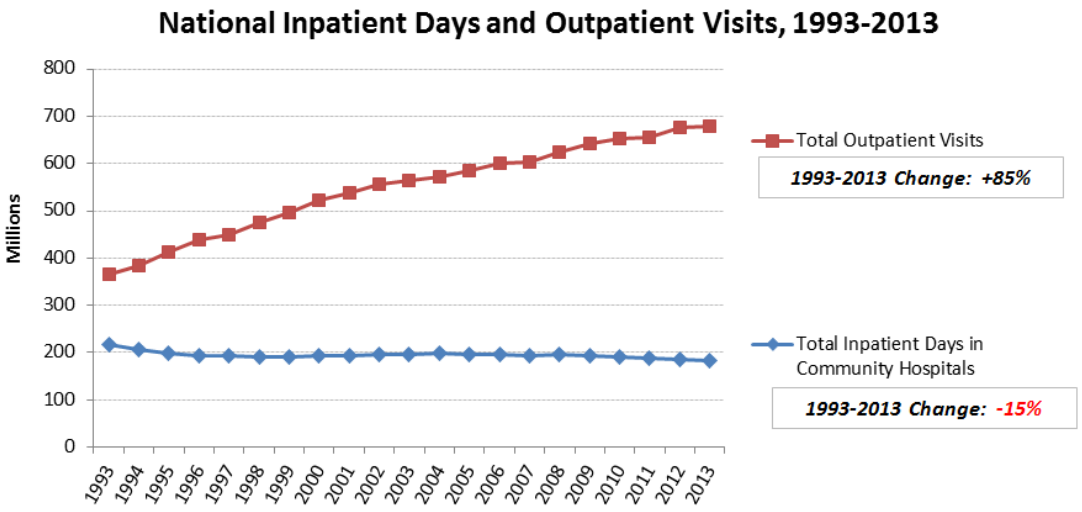
Money previously allotted to UMDNJ for University Hospital continues to go to University Hospital. The Act stipulates that the State must provide funding for University Hospital to maintain the current level of community services and its status as an acute care hospital and trauma center.

"No Regret" Initiatives

Based on our analysis of the current state and trajectory of healthcare services in the Planning Area, as well as the trends impacting healthcare delivery in the State of New Jersey and nationally, we identified several market imperatives or overarching initiatives that should be a central focus of healthcare delivery in the Planning Area in the future. These imperatives represent a series of what could be referred to as "no regrets" initiatives, namely ones that would be appropriate to implement regardless of other circumstances or conditions. In effect, they are initiatives that will have a positive impact on healthcare in the Planning Area "no matter what". These "no regrets" market imperatives include the following:

1. **Develop a more robust ambulatory/outpatient network of access points that would enable Planning Area residents to more conveniently access healthcare services in cost-effective settings.** As noted previously in this report, while there is excess inpatient hospital capacity in the Planning Area, there is limited availability and less than ideal distribution of ambulatory care services. This limited ambulatory capability almost certainly contributes to access and affordability challenges for Planning Area residents. Over the last thirty years, the healthcare industry has seen a profound shift in the site of care from the inpatient setting to the outpatient/ambulatory arena. In fact, statistics show that since 1993, the number of outpatient visits in the U.S. has increased by 85% while inpatient days have declined by 15% (See Figure 9-1 below).

FIGURE 9-1: SHIFTING SITE OF CARE



Source: AHA Trendwatch Chartbook, 2014

In light of the relatively limited ambulatory/outpatient capability in the Planning Area and the historical and ongoing shift from inpatient to outpatient care settings, it would appear essential that there should be a specific focus on developing a more robust ambulatory/outpatient network of access points that would enable Planning Area residents to more conveniently access healthcare services in cost-effective settings.

2. **Increase the coordination among the FQHCs in the Planning Area, as well as between the FQHCs and other service providers to optimize the allocation of scarce resources to areas of greatest need/maximum impact**. Affordable, timely access to primary care is a significant concern for many Planning Area residents, as evidenced by the designation of portions of the Planning Area as MUA/P. While the Planning Area is served by three FQHCs, all of which play important roles in addressing access to care, there is strong evidence that there is a lack of sufficient coordination among the FQHCs as well as between the FQHCs and other service providers to optimize the allocation of scarce resources to areas of greatest need/maximum impact. In addition, it would also appear that there is a substantial need to enhance and improve the coordination and linkages between the FQHCs and policy makers to ensure better alignment of resources with needs in the Planning Area.

3. **Increase organization of physicians to effectively move to (and succeed in) a "Curve Two" world characterized by valued-based reimbursement and population health management.** The predominance of aging and solo and small group practices in the Planning Area poses a major challenge to achieving the

degree of coordination and organization necessary among physicians to address the requirements of a changing healthcare marketplace. The predominance of solo and small group practices in the Planning Area also represents a business model that is rapidly disappearing in other areas of the United States, as physicians face increasing costs and regulatory pressures that can often be better addressed through the economies of scale associated with larger practices. In addition, generational and gender changes are transforming the practice of medicine in the U.S. As shown in Table 9-1 below, approximately 40% of physicians in practice today are under the age of 45 and thus are part of the "gen X" and "millennials" generations.

TABLE 9-1: PHYSICIANS BY AGE GROUP

Age Category	< 35	35-44	45-54	55-64	≥ 65	55 + Total
NJ (All Physicians)	12%	20%	22%	22%	24%	**46%**
US (All Physicians)	15%	21%	21%	20%	22%	**43%**
US (Patient Care Physicians)	17%	24%	25%	23%	11%	**34%**

Note: All Physicians include physicians in administrative, teaching and other non-patient care roles in addition to physicians listing patient care as their primary role.
Source: Physician Characteristics and Distribution in the US 2014 edition (2012 data) published by the AMA.

And as has been well documented in the press, the "gen X" and "millennial" generations have a very different approach to work, with a more significant focus on work-life balance than predecessor generations, particularly the "baby boomers." From a gender standpoint, the field of medicine is rapidly moving away from a field dominated by men (approximately 70% of physicians in practice today are male) to one that is much more balanced, as more than 50% of the physicians graduating from medical school today are female. These generational and gender shifts are major contributing factors to the decline in solo and small group practices and the corresponding growth in physician employment by hospitals and large physician groups, as younger physicians and female physicians seek work environments that offer a better work-life balance and

financial security than offered by solo and small group practice. As a result, there is a clear imperative to foster greater alignment, coordination, and integration of physicians with each other and with area providers.

4. **Coordinate and integrate care across the full continuum to ensure Planning Area residents have access to the right care in the right place at the right time at the right price.** As is the case in many areas of the United States, the healthcare "system" in the Planning Area consists of a group of independent entities, with each organization striving on its own to do what it does to the best of its ability. In spite of these good intentions, there is a pronounced lack of coordination and communication among the various parts of the "system," which leads to highly fragmented, more expensive care. Going forward, there should be a concerted effort to coordinate and integrate care across the full continuum. Doing so would help address the Planning Area's comparatively high utilization levels, longer lengths of stay, and higher costs.

Reconfiguration Options

Part of our engagement involved identifying and assessing the strategic, operational, and financial implications of a range of potential options (or scenarios) to better align the healthcare resources in the Planning Area with the current and future healthcare needs of Planning Area residents. We should note that in identifying and analyzing these options we did not attempt to identify every possible scenario; rather we focused on identifying and analyzing those options that appeared the most practical and viable.

As a starting point, we assessed what would happen if the status quo were maintained. In other words, what would the situation be in the future if each of the five study hospitals continued to operate as they currently do, offering all services currently provided with no changes. This is, in essence, the "do nothing" scenario. Based on projected utilization in the Planning Area (as discussed in Section 7 of this report) and using a set of reasonable revenue and expense assumptions (see the Appendix for additional details on the assumptions used), the combined projected financial performance of the five study hospitals would go from an operating loss (excluding the State charity care subsidy) of $32 Million in 2013 to more than $190 Million in 2019. This level of operating loss is clearly unsustainable and leads us to conclude that continuation of the status quo is not a financially viable or prudent option. Furthermore, this option would do nothing to address the substantial excess capacity and unnecessary duplication of services.

Given that the status quo is not a viable option and the Planning Area has unnecessary duplication of services, along with a current and projected excess bed capacity, we identified several options to align the supply of healthcare services with the Planning

Area's need for healthcare services both now and in the future. As noted above, we focused on identifying a defined set of practical and viable options rather than trying to identify as many potential options as we could. This focused process resulted in the identification of two types of options:

1. **Service line rationalization.** As noted in the report and summarized in the conclusions, there is unnecessary duplication of services in the Planning Area. This unnecessary duplication results in suboptimal occupancy levels and financial performance as well as creates challenges in terms of maintaining clinical efficacy. In this type of option, selected, unnecessarily duplicated inpatient services would be consolidated into a single site (or fewer sites) that could generate sufficient volume to achieve clinical and financial viability.

2. **Reposition/repurpose/transform.** The second type of option we identified encompasses a series of options, each of which involved changing the role of one (or more) of the study facilities to align service capabilities and capacities more closely with current and anticipated future healthcare needs in the Planning Area. In developing these options we identified and assessed separate scenarios that involved transforming each of the study hospital facilities into a state-of-the-art ambulatory care campus providing a comprehensive array of outpatient services designed to meet community needs, including freestanding ED, ambulatory surgery, imaging, select outpatient services, and physician offices. Because the extent of the excess bed capacity in the Planning Area (approximately 320 beds by 2019) is greater than the current average daily census of each of the study hospitals with the exception of NBIMC, we also considered more transformational reposition/repurpose/transform scenarios that included more than one facility. In addition, we also evaluated repurposing Broadway House to serve a broader population than HIV and AIDS patients. This role expansion would facilitate a higher level of occupancy at Broadway House, while also creating the opportunity to improve hospital acute care length of stay management.

The scenarios we evaluated are summarized in Figure 9-2 below.

FIGURE 9-2: REPOSITION/REPURPOSE/TRANSFORM SCENARIOS

1.	**Baseline: Status Quo/No Change**
2.	**Service line rationalization**; inpatient pediatrics and cardiac surgery both consolidated at NBIMC campus
3.	**Reposition/transform CMMC into a state-of-the-art ambulatory care facility** that offers a comprehensive array of outpatient services designed to meet community needs. Inpatient volume would be redistributed to other hospitals in and near the Planning Area.
4.	**Reposition/transform EOGH into a state-of-the-art ambulatory care facility** that offers a comprehensive array of outpatient services designed to meet community needs. Inpatient volume would be redistributed to other hospitals in and near the Planning Area, including the forensic unit (potentially to Clara Maass).
5.	**Reposition/transform SMMC into a state-of-the-art ambulatory care facility** that offers a comprehensive array of outpatient services designed to meet community needs. Inpatient volume would be redistributed to other hospitals in and near the Planning Area.
6.	**Reposition/transform NBIMC into a state-of-the-art ambulatory care facility** that offers a comprehensive array of outpatient services designed to meet community needs. Inpatient volume would be redistributed to other hospitals in and near the Planning Area.
7.	**EOGH and SMMC are both repositioned as state-of-the-art ambulatory care facilities** as outlined in Scenarios 3 and 4.
8.	**Reposition/transform UH into a state-of-the-art ambulatory care facility** that offers a comprehensive array of outpatient services designed to meet community needs. Inpatient volume would be redistributed to other hospitals in and near the Planning Area.
9.	**EOGH, SMMC, NBIMC are all repositioned as state-of-the-art ambulatory care facilities and an appropriately sized world-class regional medical center is developed on the University Hospital site** to address the healthcare needs of the Planning Area residents in a clinically appropriate, operationally efficient, and financially viable manner.

It is worth noting that all reconfiguration scenarios described above result in improved aggregate financial performance compared to the status quo scenario as shown in Table 9-2 below. This is a clear indication that virtually any of the options—other than no

action—will better position the Planning Area healthcare resources to be more aligned with area needs in the future.

TABLE 9-2: SUMMARY OF SCENARIO ANALYSIS

Indicator	*Scenario 1: Baseline/ Status Quo*	*Scenario 2: Rational-ization*	*Scenario 3: Clara Maass Transfor-mation*	*Scenario 4: EOGH Transfor-mation*	*Scenario 5: SMMC Transfor-mation*	*Scenario 6: NBIMC Transfor-mation*	*Scenario 7: SMMC + EOGH Transfor-mation*	*Scenario 8: UH Transfor-mation*	*Scenario 9: SMMC+ EOGH Transfor-mations + NBIMC/UH Consolidation*
Available Beds (2019)	1,527	1,550	1,251	1,326	1,317	1,203	1,137	1,267	998
Bed Need (2019)	1,208	1,208	1,070	1,154	1,157	1,036	1,095	1,080	996
Required Capital Investment (including all Baseline Needs)	$411M	$415M	**$380M**	**$408M**	**$386M**	**$405M**	**$433M**	**$464M**	**$1,017M**
2019 Aggregate Operating Income (Loss)	($191M)	($177M)	($142M)	($144M)	($134M)	($99M)	($93M)	($68M)	$64M
2019 Aggregate Operating Margin %	-11%	-10%	-9%	-8%	-8%	-6%	-6%	-4%	4%
Improvement over baseline	0%	3%	9%	9%	12%	18%	18%	22%	24%
Improvement calculation **Scenarios 1-8, 2015-2019 avg, Scenario 9, 2018-2019 avg*	=	*Annual Improvement over Baseline Operating Income* / *Capital Investment*							

Recommendations

Based on the study analytics and the conclusions outlined previously, we developed a series of recommendations to align the healthcare resources in the Planning Area with current and future needs. These recommendations take into consideration the Guiding Principles and the assessment of options referenced previously.

The analysis of current and projected need for services in the Planning Area indicates quite clearly that there is significant excess inpatient capacity in medical/surgical, pediatric, and behavioral health and unnecessary duplication of services. The study hospitals have not made significant progress in reducing the excess bed capacity and duplication of services that exist in the area on their own, and it is unlikely they will be able to do so with all five hospitals continuing to operate in their current configuration. Similarly, maintaining the status quo (even with modest individual "rightsizing" initiatives) would be highly unlikely to do anything to mitigate the need for significant, ongoing financial support from the State. As a result, we believe maintaining the status quo is not a practical or appropriate scenario and should be avoided if at all possible.

We believe the study hospitals should reduce excess/unused bed capacity and seek to achieve the level of patient volumes necessary to enhance clinical quality, operational efficiency, and financial performance by consolidating under-utilized services. We recommend the study hospitals work collaboratively with one another and the State to

explore and pursue potential service consolidation opportunities in the near-term. We believe there are significant consolidation opportunities that would help align bed supply with need; improve the clinical quality, operational efficiency, and financial performance of services and facilities; and enhance the ability to recruit and retain an appropriate complement of high-quality physicians, clinical staff, and support personnel. However, while we strongly believe implementation of the service consolidation opportunities would improve the situation in the Planning Area, service consolidation would not be sufficient in and of itself to address the multitude of issues confronting the Planning Area.

There is currently an excess of approximately 224 beds in the study hospitals, which is expected to increase to a projected 319 beds in 2019. In addition, all five hospitals require significant capital expenditures to address major facility and infrastructure needs over the next five years in order to extend their useful lives. These facts create a compelling rationale for repositioning/repurposing/transforming some of the study hospitals.

Based on our analyses and the conclusions presented previously, we have formulated the following recommendations, which we believe should be seen as additive and sequential rather than as separate or discrete. In effect, we believe the recommendations represent a way forward to reduce unnecessary duplication of services in the Planning Area in an orderly manner to better align resources with needs. While the recommendations can be seen as a series of initiatives that build on and complement each other, they can be implemented sequentially, concurrently, or in combination. Regardless of the order in which they are implemented, each of them will enhance the financial performance of the study organizations, better align capacity with demand, and position the study organizations for the healthcare industry's accelerating transformation to value-based care. The recommendations include the following:

Recommendation #1: Consolidate Inpatient Pediatrics and Cardiovascular Surgery Services at Newark Beth Israel Medical Center.

Although the study hospitals have made relatively little progress in aligning their overall inpatient bed capacity with the steadily declining demand, there has been some "ad hoc" service rationalization and reduction in duplication of services in the Planning Area over the years as evidenced by the elimination of inpatient pediatrics and obstetrics at EOGH and SMMC and neurosurgery is performed primarily at UH. Please note however that while only 3 of the 5 hospitals maintain dedicated inpatient pediatric units, all of them provide some level of inpatient services to children. This recommendation builds on that "ad hoc" service rationalization through a more formalized consolidation of inpatient pediatrics and cardiovascular surgical services.

Pediatric Consolidation Rationale:

The study hospitals have a combined total of 120 maintained pediatric beds and a combined average daily census of 52.0 in 2013, which is slightly higher than the pediatric ADC of 50.8 for Planning Area residents. It's important to note that NBIMC contains the Children's Hospital of New Jersey, which serves as a destination for pediatric inpatient care. Maintained pediatric beds, occupancy rates, and ADCs at each of the study hospitals are shown in Table 9-3 below.

TABLE 9-3: DEDICATED PEDIATRIC BEDS AND PEDIATRIC ADC BY HOSPITAL

Hospital	Dedicated, Maintained Pediatric Beds	2013 Pediatric Med/Surg ADC	Occupancy Rate
CMMC	22	5.2	24%
EOGH	0	2.5	n/a
NBIMC	56	24.0	43%
SMMC	0	4.8	n/a
UH	42	15.5	37%
Total	**120**	**52.0**	**43%**

Source: New Jersey Department of Health State discharge databases; internal data submitted by study hospitals; and Navigant analysis.
Note 1: Pediatric ADC defined as inpatients age 0-17 in a medical or surgical service line
Note 2: Because EOGH and SMMC do not have dedicated pediatric units, the occupancy rate has been identified as "n/a."

Inpatient pediatric utilization in the Planning Area has declined significantly since 2011, as shown in Table 9-4 below.

TABLE 9-4: TOTAL INPATIENT PEDIATRIC UTILIZATION IN PLANNING AREA

Operational Metric	2011	2012	2013	% Change from '11-'13
Discharges	5,617	5,061	4,708	-16.2%
Days	21,122	19,655	18,551	-12.2%
ADC	57.9	53.8	50.8	-12.3%

Source: New Jersey Department of Health State discharge databases; Pediatric Utilization limited to Med/Surg discharges age 0-17.

The pediatric ADC at the individual study area hospitals in 2013 was 5.2 at CMMC, 2.5 at EOGH, 24.0 at NIMC, 4.8 at SMMC, and 15.5 at UH. At an ADC of less than 10 patients, maintaining staff proficiency becomes very challenging and financial viability is almost impossible. As noted in Section 3 of this report, the pediatric age population in the Planning Area is projected to decrease between 2014 and 2019, as is the population of women of child-bearing age. The combination of declining utilization and a shrinking pediatric population will result in a pediatric average daily census in the study hospitals of 48.0 in 2019, down from its 2013 level of 52.0. Note that table 9-2 is the total pediatric census at the study hospitals, including volume at NBIMC, which has a large proportion of its pediatric volume from outside the planning area. Table 9.3 is the pediatric volume of the planning area population. Given the supply of maintained pediatric beds in the Planning Area (120), the projected combined pediatric ADC of 48 in 2019 would represent substantial excess capacity and unnecessary duplication of service, particularly in the hospitals with smaller pediatric units.

Nationally, the trend in pediatrics is toward dedicated children's facilities with enough scale to provide 24 hour, 7 day per week specialty coverage. The traditional community hospitals with the prototypical 21-bed inpatient pediatric unit face daunting if not insurmountable challenges in maintaining clinical quality and achieving economic viability with low (and declining) pediatric ADCs. NBIMC is the home of Children's Hospital of New Jersey, a 56-bed facility with approximately 30 pediatric subspecialties on staff and a comprehensive array of inpatient and outpatient pediatric services including:

- Children's Heart Center,
- State-designated regional perinatal center,
- Pediatric intensive care unit,
- Pediatric emergency department,
- Neonatal Sudden Infant Death Syndrome (SIDS)/Apnea Center,
- Valerie Fund Children's Center for Cancer and Blood Disorders,
- Neonatal ICU with New Jersey's only ECMO unit,
- HIV/AIDS treatment for children as well as a sexual and child abuse program.

The consolidation of inpatient pediatrics services at Children's Hospital of New Jersey at Newark Beth Israel Medical Center moves the small inpatient pediatric volumes at the other study hospitals to the largest existing provider in the Planning Area and one with specialized services and coverage. Analysis of the facilities at NBIMC indicated that NBIMC could accommodate the incremental volume with limited capital investment of ~$4 Million. In addition, consolidation of inpatient pediatrics at NBIMC should reduce fixed expenses as well as improve coordination of physician capacity in the area.

It should be noted that this recommendation does ***not*** anticipate discontinuation of pediatric ***services*** at either CMMC or UH. Rather, we strongly recommend maintaining

a robust ambulatory pediatric service at both facilities. In addition, we suggest that both CMMC and UH explore the possibility of developing a small (e.g., 4-6 bed) area adjacent to the ED (staffed by the ED) to accommodate pediatric patients needing assessment/observation and prepare for transfer to the Children's Hospital of New Jersey as appropriate. This is a model of providing pediatric service without having a dedicated inpatient unit that many hospitals are adopting, in that it allows physician coverage of the ED and the pediatrics area with a single physician, and to a lesser extent nursing as well. By doing this, a hospital is able to provide enough volume for the staff to keep up their skill set and have a more stable work expectation in low volume seasons.

Consolidation of inpatient pediatrics at NBIMC would, therefore help reduce excess capacity and unnecessary duplication of services, improve the combined financial performance of the study hospitals, better align the Planning Area's healthcare resources with current and future needs, and would therefore be entirely consistent with the Guiding Principles delineated previously.

Cardiac Surgery Consolidation Rationale:

Recommended annual hospital volumes for select cardiac procedures include a minimum of 450 Coronary artery bypass graft patients and a minimum of 120 aortic valve replacements patients. SMMC and UH are low volume programs with 127 and 81 discharges, respectively in 2013; NBIMC performed approximately 678 cardiac surgeries in 2013. Table 9-5 below provides the cardiac surgery volume and ADC for the three Planning Area hospitals performing cardiac surgery.

TABLE 9-5: CARDIAC SURGERY VOLUME BY HOSPITAL 2013

Hospital	Discharges	Days	ADC
NBIMC	678	9,535	26.1
SMMC	127	1,045	2.9
UH	81	698	1.9

Source: New Jersey Department of Health State discharge databases; internal data submitted by study hospitals; and Navigant analysis.
Note: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.

National cardiac surgery volumes have declined steadily in the last few years. According to the Department of Health and Human Services, national cardiac surgery volumes from 2009 to 2012 declined by 9.5%, and use rates have declined by 11.3% during this same period. These declines reflect the impact of several trends in cardiac surgery, including:

- Increase in prevalence of minimally invasive cardiac procedures, which decreases the length of hospital stays and increases the likelihood of a faster recovery;
- Increase in outpatient cardiac procedures;
- Focus on improving population health management, emphasizing activities that improve heart health; and
- Increase in management of cardiac conditions through medication.

These national shifts have yet to be felt significantly in the Planning Area as total market cardiac surgery volumes were essentially unchanged from 2011 to 2013 (522 total cases in 2011 vs. 529 cases in 2013). Given national trends, however, it is very likely the Planning Area will see a decrease in the demand for cardiac surgery over the next few years. Note that as is the case with pediatric volume, in-migration to the service area for cardiac surgery means the volume at the study hospitals in total is larger than that of the Planning Area residents.

Given the national trends in cardiac surgery, the limited population growth projected in the Planning Area, and the presence of a large number of major cardiac centers in the New Jersey and New York region (i.e., 7 of the Top 50 Cardiac Hospitals according to U.S. News and World Report's 2014-2015 rankings) the prospect of seeing sufficient growth in cardiac procedures to enable all three hospitals to achieve recommended minimum volumes is highly unlikely. In looking at the existing cardiac surgery programs in the Planning Area, NBIMC's is by far the largest, performing over three times as many procedures in 2013 than SMMC and UH combined and its program is recognized by U.S. News and World Report as one of the highest performing programs in cardiology and heart surgery in the region and the U.S. NBIMC is also one of the top three centers in the United States in terms of heart transplants. An analysis of the NBIMC facility identified 5 catheterization labs. Our assessment of the existing capacities of NBIMC indicated that the cardiac surgery volumes from SMMC and UH could be accommodated at NBIMC without additional capital investment. In addition, the facility analysis also showed that neither SMMC's or UH's facility could handle the consolidated volume without significant capital investment. Consolidation of the cardiac surgery volumes at NBIMC should not preclude the other two facilities from providing a strong non-invasive cardiology service and in fact, they will have an opportunity to develop a high quality ambulatory cardiac service.

As was the case with the recommendation to consolidate inpatient pediatrics to a single site, consolidation of cardiac surgery at NBIMC should reduce fixed expenses as well as improve coordination of physician capacity in the area. We believe therefore that consolidation of cardiac surgery to a single site (NBIMC) would help reduce excess capacity and unnecessary duplication of services, improve the combined financial performance of the study hospitals, and better align the Planning Area's healthcare

resources with current and future needs, and would therefore be entirely consistent with the Guiding Principles delineated previously.

We do need to note, however, that analysis of the financial impact of these two service line rationalizations indicate that while the combined financial performance of the five study hospitals would be better than in the status quo scenario, it would still represent a substantial aggregate five hospital annual operating loss of approximately $177 Million in 2019 (versus a baseline aggregate operating loss of $191 Million). This service line rationalization option therefore represents an improvement over the status quo from a financial perspective and will help the consolidated programs achieve sufficient volumes to enhance operational efficiency and clinical efficacy. However, the significant combined operating loss would appear to indicate that while this option may be appropriate and necessary, it is clearly not sufficient to address the excess capacity and financial performance issues of the Planning Area hospital facilities

Recommendation #2: Expand Broadway House's role to include post-acute care.

Broadway House is New Jersey's only specialized facility for people living with HIV/AIDS. As a result of the progress that has been made in HIV/AIDS care both locally and around the country, Broadway House has experienced a steady decline in occupancy: from 75% in 2012 to 62% in 2014, based upon annualized results from first six months of FY 2014. Given this drop in occupancy, Broadway House has the ability to serve an additional 20 (or possibly more) patients per day. This capacity could be repurposed to serve a population in addition to Broadway House's core base of HIV and AIDS patients. As noted in Section 5 of this report, the study hospitals had a higher ALOS than hospitals in New Jersey and the national overall, as shown in Table 9-6 below.

TABLE 9-6: AVERAGE LENGTH OF STAY BY GEOGRAPHY

Geography	2011	2012	2013
Study Hospitals	5.73	5.80	5.86
New Jersey	5.15	5.14	5.20
United States	5.20	5.20	5.30

Source: New Jersey Department of Health State discharge databases; American Hospital Association Statistics Guide 2015.
Note 1: Excludes DRG 795 (normal newborns), LOS =0, and invalid DRGs.
Note 2: ALOS numbers for United States are based on Nongovernment not-for-profit

One of the causes of a higher ALOS in acute care hospitals across the U.S. and throughout New Jersey is the lack of sufficient post-acute capacity to accommodate patients who need to be discharged from the hospital but who are not ready to go home. Repurposing some of Broadway House's capacity to care for post-acute care patients in addition to HIV/AIDS patients would almost certainly help the study hospitals to improve length of stay management by making additional post-acute capacity available.

In addition to helping improve length of stay management, repurposing Broadway House would also address one of the issues noted in the conclusions presented previously, namely that there is a pronounced lack of coordination and communication among the various parts of the healthcare "system" in the Planning Area, which leads to highly fragmented, more expensive care. Nationally, healthcare systems are strengthening their alignment with post-acute care providers to enhance continuity and collective population health management capabilities. Repurposing Broadway House in accord with this recommendation would help with the effort to coordinate and integrate care across the full continuum and therefore would help better align the Planning Area's healthcare resources with current and future needs, and would be consistent with the Guiding Principles delineated previously.

Recommendation #3: Transform East Orange General Hospital and St. Michael's Medical Center into state-of-the-art ambulatory care facilities.

Rationale:

As noted elsewhere in this report, the Planning Area has a substantial surplus of inpatient hospital beds, and this surplus is projected to increase steadily over at least the next five years. Excluding all newborn beds, but including the need for observation beds, in 2013, the Planning Area hospitals had 1,495 available beds compared to a need for 1,271 beds, resulting in an excess supply of 224 beds. With the addition of 32 available beds under construction at CMMC and expected continuation of declines in demand, this excess capacity is projected to increase to 319 beds by 2019. Furthermore, the Planning Area lacks a well-developed network of easily accessible and affordable ambulatory care facilities. And while we believe the recommendations to consolidate inpatient pediatrics and cardiac surgery and to expand Broadway House's role are necessary and appropriate, they are clearly not sufficient to fully address the challenges facing the Planning Area. The facts of the situation in the Planning Area dictate that a more significant and proactive course of action is needed (in addition to the service consolidation and expansion of Broadway House's role): namely, the repositioning/repurposing/transformation of EOGH and SMMC from their current position as small, struggling community hospitals into state-of-the-art ambulatory facilities.

We assessed a number of scenarios that involved repositioning/repurposing/ transforming every one of the five study hospitals to address the surplus capacity, unnecessary duplication of services, and the combined financial performance of the study hospitals and the scenario that appeared to represent one of the best of those options was one that called for the transformation of both EOGH and SMMC. There were a number of compelling reasons this scenario represented a viable option, including the following:

- EOGH and SMMC have the lowest inpatient average daily census of the study hospitals, with ADCs of 112 and 116 patients, respectively. The other three hospitals had ADCs that were at least twice as large (CMMC 230, NBIMC 324, and UH 246). As a result, the transformation of EOGH and SMMC would impact the fewest number of inpatients of any of the scenarios. In addition, EOGH and SMMC are the two facilities with the shortest driving distances to another Planning Area inpatient facility—1.8 miles from EOGH to UH and 1.3 miles from SMC to UH.

- Based on an analysis of where the inpatients cared for at EOGH and SMMC reside, it appears that approximately 60% of those patients would be cared for at the other Planning Area hospitals while the other 40% would likely seek care at other facilities in northern New Jersey that are closer to their homes than the remaining Planning Area inpatient facilities. Given this redistribution of inpatients, CMMC would need to add an additional 29 beds and NBIMC would require an additional 36 beds. Review of the facilities at CMMC and NBIMC showed that additional nursing unit rooms currently exist that could accommodate the additional inpatient volumes with minimal renovation expense. The resulting supply of available beds in this scenario (1,137) closely matches the bed need in the Planning Area (1,095).

- There is a considerable degree of overlap of the medical staffs at EOGH and SMMC with other study hospital medical staffs, with 45% of EOGH's medical staff and 48% of SMMC's medical staff on staff at one (or more) of the other study area hospitals. As a result, most physicians have the ability to transition their inpatient cases between facilities if necessary. In light of the physician shortages in the area as evidenced by the presence of MUA/Ps and documented in the New Jersey Council of Teaching Hospital's 2008 Physician Workforce Study, along with the aging of the physicians on staff at the study hospitals, it is likely that the hospitals would welcome additional physicians to their medical staffs.

- EOGH and SMMC are the most challenged of the study hospitals from a financial performance perspective, as they had the lowest operating margins of the five study hospitals and their operating margins were negative in both 2012 and 2013. In addition, the operating expense per adjusted discharges (CMI and Wage-Index

Adjusted) at EOGH and SMMC was substantially higher than the Truven Median National Benchmark for medium-sized community hospitals at $7,996 and $8,025 respectively compared to the benchmark of $7,203. On the other hand, CMMC's operating expense per adjusted discharge ($6,182) was significantly below the Truven benchmark for medium-sized community hospitals and NBIMC's was well below the Truven benchmark for major teaching hospitals.

- EOGH and SMMC both perform below the NJ state average, as well as the other 3 study hospitals, on publicly available measures of Quality and Patient Satisfaction (as indicated in Section 5)

- As shown in Table 9-6 below, the reposition/repurpose/transform scenarios we identified all resulted in improved combined financial performance versus the status quo, and the transformation of EOGH and SMMC produced the third best financial result of the various scenarios we evaluated.

It is important to note that this scenario involves repositioning/repurposing/ transformation of EOGH and SMMC, ***not*** their closure. In looking at the needs of the community and taking into consideration the excess inpatient capacity and the relative lack of ambulatory facilities as well as the physical condition of the existing facilities, we developed a high-level conceptual transformation scheme that calls for EOGH and SMMC to continue to function as vibrant healthcare resources for their respective communities and the Greater Newark area, providing a comprehensive array of ambulatory and outpatient services.

For EOGH, the transformation would entail providing emergency services, ambulatory surgery, outpatient services, and physician offices in the two-story 1990s era building with existing surgery on the lower level and adapting the upper level to serve as a freestanding emergency center. The Medical Arts Building, Hope Gardens, and the East Pavilion would also be retained. This transformation would result in an ambulatory center of approximately 248,000 square feet. The existing "Forensic Unit" would need to be relocated to a unit that would need to be "hardened" in another facility (possibly the South Annex at CMMC).

At SMMC, the transformation would involve maintaining the six-story "M" wing adjacent to the new Cancer Center and converting it into an ambulatory pavilion of approximately 130,000 square feet that provides emergency services in the recently renovated Emergency Department, ambulatory surgery, imaging, outpatient services, and physician offices. The outpatient Cancer Center would remain as a key service offering.

While the high-level conceptual plan outlined above will need to be more fully developed, this scenario will benefit the community by aligning capacity and demand, increasing clinical efficacy, and improving financial performance to increase the study organizations'

ability to effectively manage and improve the health of Planning Area residents. It is clear that this scenario represents a substantial move toward better aligning the Planning Area's healthcare resources with current and future needs and addressing the need for improved financial performance of Planning Area facilities.

Recommendation #4: Develop a state-of-the-art regional medical center in Newark.

This recommendation is intended to build on Recommendation #3 and would take place following the transformation of EOGH and SMMC. There are a number of components to this recommendation, including the following:

- **Functional and operational integration of NBIMC and UH.** NBIMC and UH are the two facilities in the Planning Area providing tertiary and quaternary level care. They currently have a cooperative working relationship and in fact, NBIMC's parent organization (Barnabas Health) provides UH with management assistance as UH works to improve its financial and operating performance. As such, there is an opportunity to further and more formally develop the collaborative relationship between these providers through functional and operational integration. Integration of NBIMC and UH would facilitate achievement of the "critical mass" of patients needed to enhance clinical efficacy and improve financial performance in key programs and services and would help address the unnecessary duplication of services in the Planning Area.

- **Expansion of the UH campus to accommodate NBIMC's inpatient services.** Neither NBIMC nor UH currently have the inpatient capacity to absorb the patient volumes of the other, along with the portions of EOGH's and SMMC's inpatient volumes that would likely be redirected to them. As part of this scenario we did consider development of a completely new regional medical center in the Greater Newark area that would replace both NBIMC and UH. While a completely new replacement medical center has a number of significant advantages, it would be a very expensive alternative. However, in reviewing the facilities and campuses of NBIMC and UH, the UH campus appears to have sufficient expansion potential with relocation of the "temporary" Rutgers metal office buildings and the relocation of the DOC parking garage to accommodate the projected patient volumes. The NBIMC campus, on the other hand, has less in the way of potential expansion zones and any consolidation there would likely be far more expensive.

- **Transformation of the NBIMC campus into a comprehensive ambulatory campus.** Once the expansion of the UH campus is completed, this scenario calls for the NBIMC campus to be transformed into a state-of-the-art ambulatory campus. This transformation would entail providing emergency services,

ambulatory surgery, imaging, outpatient services, and physician offices. The Cancer Center would remain. The Ambulatory Building (including the bridge to the Outpatient wing), the Outpatient wing, and the 182 Lyons building would be retained along with the apartment tower of the main hospital. This configuration would create a major ambulatory campus consisting of approximately 260,000 square feet.

- **Formation of a public-private partnership.** The recommendation to develop a state-of-the-art regional medical center on the UH campus represents an enormous undertaking. And we believe it is an undertaking that can best be accomplished through a public-private partnership that is able to access and leverage the capabilities and resources of the State, the County, and the City along with those of private entities and stakeholders in the region. There are a number of successful examples of public-private partnerships in healthcare including Seton Brackenridge University Hospital in Austin, Texas and Boston Medical Center in Boston, Massachusetts. Brackenridge Hospital is the oldest public hospital in Texas and is the regional level 1 trauma center and main clinical setting for UT-Austin medical students and residents. Owned by the city of Austin, Brackenridge provided a tremendous amount of charity care, in part because of the high number of uninsured residents in Texas. This high level of charity care contributed to Brackenridge's financial struggles and resulted in the city of Austin reaching out to potential financial partners. In 1995, Seton Health (a member of the Catholic Ascension Health system) signed a 30-year lease agreement with the city and took over operations of the facility. Subsequently Seton and Austin agreed on plans to construct a $250 Million replacement hospital to be paid for by Seton. In July 1996, Boston University Hospital and Boston City Hospital merged to form Boston Medical Center. BMC is a not-for-profit organization and is the principal teaching affiliate of the Boston University School of Medicine. BMC has retained its character as the primary charity care provider in Boston and operates an ambulatory network with Boston HealthNet, a network of 15 modern FQHCs, some of which are owned directly by BMC. This ambulatory network provides the majority of BMC's patient volume. As an aide to then mayor Thomas Menino said about the public-private partnership, "*The merger is not about saving hospital buildings, beds, or even a medical school. It is about saving an urban health system.*"

Rationale:

The underlying rationale for this recommendation to develop a state-of-the-art regional medical center in Newark includes the following key points:

- As noted in the discussion of the Guiding Principles section of this report, the New Jersey Medical and Health Sciences Restructuring Act of 2013 stipulates that the State must provide funding for University Hospital to maintain the current level of community services and its status as an acute care hospital and trauma center. Therefore, even though we evaluated a scenario that called for transforming UH into an ambulatory center, that scenario does not appear viable from a legal or regulatory perspective. The statue clearly indicates that UH must remain as an acute care hospital, thereby precluding its repositioning /repurposing /transformation as an ambulatory campus.

- This scenario is the one that best balances future bed supply (998 beds, which reflects the transformation of EOGH, SMMC, and NBIMC) with future bed need (996 beds needed to accommodate projected inpatient volumes).

- This scenario is the only one we assessed that resulted in a positive operating margin on a combined basis for the Planning Area providers as shown in the Table 9-2 previously.

- While the capital investment required in this scenario is substantial, it results in a combined positive operating margin because the transformation of EOGH and SMMC, combined with the merger of NBIMC and UH into a more modern facility, substantially decreases the operating expenses associated with caring for the patient population in the Planning Area. The fixed expenses associated with keeping the five Planning Area hospitals open independently as full-service, acute care hospitals are reduced as facilities are transformed, better matching acute care demand and supply.

- As noted above in the description of the recommendation, the UH facility infrastructure appears to be in the best condition of the five study hospitals and its campus has some potential expansion options. NBIMC, on the other hand, appears to require the most capital investment of the study hospitals to address necessary upgrades.

- Implementation of this recommendation would redirect dollars currently spent to subsidize the study hospitals and support excess capacity and duplication of services to invest in the transformation of healthcare in the area and better prepare the study organizations for "Curve Two".

The development of a state-of-the-art regional medical center should be part of a larger initiative which involves preparing a comprehensive urban healthcare redevelopment

plan to address the healthcare needs of the Planning Area residents in a clinically appropriate, operationally efficient, and financially viable manner. A comprehensive and coordinated approach to healthcare redevelopment would serve the Newark area through alignment of capacity with need, improved coordination of services across the continuum, and economic development. Consideration should also be given to establishing a regional healthcare consortium to manage and operate the healthcare resources in the study area. One of the factors that likely has contributed to the current situation is the fragmented nature of the delivery system in the Planning Area and designating a single entity to oversee the development and deployment of resources would lead to greater coordination and less unnecessary duplication of services as well as generate savings through economies of scale and skill.

Section 10 – Key Implementation Steps

The recommendations outlined in this report represent a major transformation of the healthcare delivery system in the Greater Newark area. As such, they will play out over a several year period. And as noted previously, they are intended to complement and build on each other. We have outlined a high-level implementation framework for the recommendations, recognizing there will need to be a significant degree of discussion regarding the recommendations as well as a great deal of coordination among all of the key stakeholders. Given those caveats, we believe the following represents a potential framework for implementing the recommendations:

Consolidate Inpatient Pediatrics and CV Surgery Services at NBIMC.

The detailed plans and approvals for this recommendation should be targeted for completion in 2015, with the transfer of services taking place in 2016 and the recommendation being fully implemented by 2017.

Expand Broadway House's Role to Include Post-Acute Care

Implementation of this recommendation should be initiated in 2015 and fully implemented by 2016.

Transform EOGH and SMMMC into State-of-the-Art Ambulatory Care Facilities

This recommendation will entail more planning and approvals than the first two recommendations and as a result, it is likely that 2015 and 2016 will be required for these activities, with full implementation of the recommendations targeted for late 2017.

Develop a state-of-the-art Regional Medical Center in Newark

As noted in the report, this recommendation is intended to build on Recommendation #3 and would take place following the transformation of EOGH and SMMC. Furthermore, this recommendation will require significant lead time for planning, financing, and construction. Therefore, initial planning should begin in 2015 and will likely take at least until 2017 with full implementation of the recommendation being completed no earlier than 2019.

Section 11 – Appendix

(See separate document)