

STAFF REPORT TO THE COMMISSIONER FOR A DETERMINATION OF NEED

Applicant Name	Beth Israel Lahey Health, Inc.
Applicant Address	100 Brookline Ave, Suite 300
Filing Date	June 25, 2021
Type of DoN Application	DoN-Required Equipment-Computed Tomography- CT
Total Value	\$4,795,388
Project Number	BILH-19092415-RE
Ten Taxpayer Group (TTG)	None
Community Health Initiative (CHI)	\$239,769.40
Staff Recommendation	Approval
Public Health Council	Delegated

Project Summary and Regulatory Review

Beth Israel Lahey Health, Inc. (the Applicant or BILH), located at 330 Brookline Avenue, Boston, MA 02215, filed a Notice of Determination of Need (DoN) Application (Application) for the expansion of computed tomography (CT) services by adding one CT unit sited in existing space on the third floor of Beth Israel Deaconess Medical Center’s (BIDMC) West Campus, located at 1 Deaconess Road, Boston, MA 02215.

This DoN application falls within the definition of DoN Required Equipment, which is reviewed under the DoN regulation 105 CMR 100.000. The Department must determine that need exists for a Proposed Project, on the basis of material in the record, where the Applicant makes a clear and convincing demonstration that the Proposed Project meets each Determination of Need Factor set forth within 105 CMR 100.210. This staff report addresses each of the six factors set forth in the regulation.

APPLICATION OVERVIEW

Background

The Applicant, BILH, is a Massachusetts, non-profit, tax-exempt corporation that oversees a regional, non-profit health care delivery system comprised of teaching and community hospitals, physician groups, behavioral health providers, post-acute care providers and other caregivers. BILH states that its purpose “is to support the patient care, research, and educational missions of its member entities” and its vision “is to have a broader impact on the health care industry and patient populations in Massachusetts by sharing best practices, investing in foundational infrastructure to support population health management, and encouraging true market competition based on value.”

Collectively known as “BILH Hospitals,” BILH’s member hospitals include:

1. BIDMC
2. Addison Gilbert Hospital;
3. Anna Jaques Hospital;
4. Beth Israel Deaconess Hospital-Milton;
5. Beth Israel Deaconess Hospital-Needham;
6. Beth Israel Deaconess Hospital-Plymouth;
7. Beverly Hospital;
8. Lahey Hospital & Medical Center;
9. Lahey Medical Center, Peabody;
10. Mount Auburn Hospital;
11. New England Baptist Hospital; and
12. Winchester Hospital

BILH operates Beth Israel Lahey Health Performance Network, LLC (BILHPN), a Massachusetts Health Policy Commission (HPC) certified Accountable Care Organization (ACO), which the Applicant states is a value-based physician and hospital network, whose goal is to partner with other community hospitals and providers throughout Eastern Massachusetts to improve quality of care while managing medical costs.

BIDMC is an Academic Medical Center (AMC) that is licensed to operate 592 acute care beds. BIDMC’s main campus consists of two sites in the Longwood Medical area, an “East” and a “West” Campus. The Proposed Project will be located on the West Campus which operates 382 licensed acute care beds, 19 operating rooms (ORs), the Emergency Department (ED), and numerous

outpatient clinics and physician offices. It is a designated Level 1 Trauma Center and is a Primary Stroke Center.¹

BIDMC is contracted with BILHPN and currently participates in its subsidiary ACO, Beth Israel Deaconess Physician Organization, LLC (d/b/a Beth Israel Deaconess Care Organization (BIDCO)).

CT Services and the Project

BIDMC provides CT services through nine (9) CT units currently in operation on the BIDMC main campus. There are four (4) CT units on the East campus and five (5) on the West campus. The West campus units include three (3) fixed CT units, and two (2) dedicated-use portable CT units.² One of the West Campus' fixed CT units serves the diagnostic needs of patients in the ED and of inpatients requiring exams during evening or overnight hours. Two of the three fixed CT units are located in the radiology department on the 3rd floor of the Rosenberg building, the site of the Proposed Project. These units provide the full range of diagnostic and interventional CT service.

The West Campus-based outpatient clinics and specialties which regularly refer patient for CTs include Gastroenterology/Hepatology, Infectious Disease, and many of the surgical specialties (Transplant Surgery, Vascular Surgery, Plastic and Reconstructive surgery, Neurosurgery, Cardiac Surgery). The Applicant reports that the current units are operating at capacity and need is growing due to an increasingly acute, and aging patient population along with technological advances that are expanding clinical applications of CT. The Applicant seeks to expand its existing CT suite to address the increasing needs.

The Proposed Project will allow for mixed uses that include diagnostic exams (scans) and treatment such as CT-guided procedures. CT-guided procedures on BIDMC's West Campus are performed for both inpatients and outpatients, with approximately 46% performed on inpatients and 54% on outpatients. A key factor that contributes to scheduling challenges is that most CT-guided procedures require 90-150 minutes of dedicated CT scan room-time per procedure while diagnostic exams take on average 15-30 minutes and currently, the same units are used for both diagnostic and procedure purposes. The Applicant noted that the presence of COVID-19 adds additional time between scans for more intensive room sanitization and preparation time between scans, thereby reducing the capacity of all units.

Factor 1

In this section, we assess if the Applicant has sufficiently addressed patient panel need, public health value, competitiveness and cost containment, and community engagement for the expansion of the CT service.

¹ Meaning it is a Joint Commission certified Primary Stroke Center
<https://www.jointcommission.org/accreditation-and-certification/certification/certifications-by-setting/hospital-certifications/stroke-certification/advanced-stroke/primary-stroke-center/>

² On the West Campus - one primarily dedicated to operating and the other to Neuro-ICU patient needs.

Patient Panel³

To meet this Factor, the Applicant is required to provide system-wide demographic data on their patient panel. The Applicant initially provided little current data on the system-wide Patient Panel citing that in the wake of their merger, their work to integrate the data of all 12 of its hospitals in the BILH system was hampered by the COVID-19 pandemic.

After subsequent discussions with the Applicant they were able to make a good faith effort to aggregate the system-wide Patient Panel data prior to fully integrating their patient information systems. The information is presented in the table below, with an explanation of the data in the footnotes.⁴

BILH Patient Panel Summary				
Demographic Measure	CY2019		CY2021 YTD (Jan 1-Jun 30)	
	Count	Percent	Count	Percent
Gender⁵				
Male	540,156	41.58%	420,116	41.67%
Female	758,253	58.37%	587,848	58.30%
Other	554	0.04%	302	0.03%
Total	1,298,963	100.00%	1,008,266	100.00%
Age⁶				
0 to 17	93,930	7.23%	53,302	5.29%
18 to 64	835,623	64.33%	638,626	63.34%
65+	369,410	28.44%	316,338	31.37%
Total	1,298,963	100.00%	1,008,266	100.00%

³ As defined in 105 CMR 100.100, Patient Panel is the total of the individual patients regardless of payer, including those patients seen within an emergency department(s) if applicable, seen over the course of the most recent complete 36-month period by the Applicant or Holder...

⁴ Notes: BILH includes Addison Gilbert Hospital, AJH, BayRidge Hospital, Beverly Hospital, BIDMC, BID-Milton, BID-Needham, BID-Plymouth, LHMC-Burlington, LHMC-Peabody, MAH, NEBH, and Winchester Hospital. □ Counts represent the number of unique patients that visited a facility on a BILH hospital license for inpatient or outpatient services, including patients who were admitted through the emergency department. Unique patients are identified at the hospital level, with the exception of Addison Gilbert Hospital, BayRidge Hospital, and Beverly Hospital, which are jointly identified as Northeast Hospital Corp. patients, and LHMC-Burlington and LHMC-Peabody, which are also jointly identified. Patients visiting multiple BILH hospitals in a given year are not uniquely identified.

⁵ Patients for whom a gender is not specified or whose gender varies across visits over the time period are included in "Other."

⁶ Patients who fall into multiple age categories in a given year are included in the younger category

Race⁷				
White	961,838	74.05%	727,808	72.18%
Black or African American	62,169	4.79%	49,721	4.93%
American Indian or Alaska Native	1,528	0.12%	1,100	0.11%
Asian	75,996	5.85%	55,020	5.46%
Native Hawaiian or Pacific Islander	867	0.07%	685	0.07%
Other	124,849	9.61%	85,942	8.52%
Unknown	62,439	4.81%	72,238	7.16%
Patient Declined	9,277	0.71%	15,752	1.56%
Total	1,298,963	100.00%	1,008,266	100.00%
Payor⁸				
Commercial	660,747	50.87%	473,709	46.98%
Medicare	336,064	25.87%	282,567	28.03%
Medicaid	152,622	11.75%	125,769	12.47%
Multiple Payors	79,601	6.13%	48,280	4.79%
Other	61,795	4.76%	72,480	7.19%
Unknown	8,134	0.63%	5,461	0.54%
Total	1,298,963	100.00%	1,008,266	100.00%
Source: Internal inpatient and outpatient visit data submitted by BILH hospitals.				

BILH Age: In CY 2019 the 65 and over age cohort represented ~ 28% of the patient panel, while in the first 6 months of CY 2021 it increased to 31%.

BILH Race: In CY 2019, ~ 26% of the Patient Panel was nonwhite or race was unknown. This information is self-reported.

BILH Payor Mix: Approximately 50% of patients have commercial payors, approximately 26% are on Medicare, ~12% are on Medicaid, 6% have multiple payors, and ~5% are other or unknown, depending upon how each hospital reports these data.

⁷ Race information is self-reported. Patients for whom a race is not specified are included in "Patient Declined," "Unknown," or "Other," per the local facility's data collection methodology. Patients for whom race varies across visits over the time period are included in "Other."

⁸ Patients whose primary payor is missing in the data are included in "Unknown." Patients whose primary payors within a given fiscal year fall into more than one payor category are included in "Multiple Payors." "Other" includes the following payor categories: self-pay, worker's compensation, other government payment, free care, health safety net, auto insurance, Commonwealth Care/ConnectorCare plans, and dental plans.

Patient Population⁹ of BIDMC

Since the Proposed Project is to be sited at BIDMC, the demographic profile of the patients served by BIDMC is shown below and race and age data are generally comparable to the BILH Patient Panel demographic profile. While the CT will be available to patients throughout the BILH system and they may benefit from the expansion of this service through tertiary referrals to BIDMC as described herein, the focus of this analysis is on the BIDMC patient population.

- **BIDMC Age** the majority of patients (70%) fall into the 18-64 age cohort. Approximately 26% are ages 65 or older. This is 2% lower than reported by the BILH Patient Panel.

Age Distribution of the Patient Population	
BIDMC 2019	%
0-17	5%
18-54	49%
55-64	19%
65-74	16%
75-84	8%
85+	2%
Unknown/Other	1%

- **BIDMC Race-** System-wide, based on self-reporting, data show whites represent ~75% of the Patient Panel with Black or African Americans and Asians representing 4.8% and 5.4% respectively, while Other is 13.4%. These percentages do not differ widely from that of the BILH Patient Panel.

BIDMC- Race 2017 ¹⁰	
White	74.6%
Black or African American	4.8%
American Indian or Alaska Native	0.1%
Asian	5.4%
Native Hawaiian or Other Pacific Islander	0.1%
Hispanic/Latino	1.6%
Other	13.4%
	100.00%

⁹ The patients population is the subset of the Patient Panel being addressed/targeted by the Proposed Project

¹⁰ The most recent year available due to delays in integration of the system as a result of the COVID-19 pandemic.

Patient Origin

- Patient origin by zip codes shows that 75% of patients come 99 zip codes,
- Most are from the east of Worcester and includes the north and south shores,
- ~25% of patients come from Boston zip codes,
- ~9% come from the surrounding zip codes supporting the Applicant’s claim that BIDMC is a community hospital for patients in their neighborhood.

BIDMC Payor Mix

Table 2 shows, FY 2019, approximately 54% of BIDMC patient encounters were covered by Medicare, Medicaid (including managed care), or Health Safety Net. In comparison, approximately 42% of Patient Panel encounters were paid by commercial payors. As reported above, for the BILH system, a larger share of patients are covered by Commercial payors and a significantly small portion is covered by public payors.

Table 2: 2019 Payor Mix %	
Category	BIDMC
Medicaid	19%
Managed Medicaid+	2%
Medicare	23%
Managed Medicare+	9%
Commercial ¹¹	42%
All Other ¹²	~4%
Total	100%
+Approx. from the information provided	

Factor 1: a) Need

The need for this one CT unit is localized to one site, BIDMC’s West Campus patient population, however as described below it is impacted by Patient Panel referrals from community-based hospitals within the BILH system. Consistent with the growth of its acute patient population, BIDMC’s total CT volume increased by approximately 8%, to 184,297 inpatient, observation, and outpatient (including emergency patient) scans (exams and procedures) over the FY 2017-2019 time-period.

The Applicant attributes growth in need to several broad interrelated categories:

1. Existing CTs operating on the West Campus are operating at capacity.
2. Increasing acuity of ED patients with changing protocols for CT scanning.
3. Increasing patient census coupled with greater acuity among inpatients.

¹¹ “Commercial” includes, but is not limited to: Aetna, Blue Cross Blue Shield, Harvard Pilgrim Health Care, and Tufts Health Plan.

¹² “All Other” includes but is not limited to: Health Safety Net Free Care, Other Government, Self-Pay, and Worker’s Compensation.

4. Increasing clinical applications including for CT guided procedures.
5. The overall prevalence of diseases where CT is an important diagnostic or treatment modality.
6. Growing population of those over age 65 whose prevalence of those diseases increases with age.

1. Existing CT's At BIDMC's West Campus Are Operating At Capacity.

The Applicant reports the West Campus CT units are operating at capacity. This is evidenced by several factors.

- a. The Applicant has extended hours from 7a.m. to 7:15p.m. to accommodate additional demand. Normal operating hours are 7am to 5:00pm. The extended hours do not include procedures and scans performed after hours on cases needing more timely attention. The Applicant stresses that it books procedures at 100% capacity but that this rate defaults to ~80% due to cancellations, failed exams, and scheduled and unscheduled downtime.
- b. Extensive wait times for needed procedures for outpatients. Currently, overall wait-time is 26 days but varies by the type of scan needed. While diagnostic imaging is 9 days, those needing CT procedures wait an average of 28 days, and those needing cardiac imaging wait 41 days. Certain complex services such as cardiac imaging and procedural applications have longer wait times when compared to routine imaging. Times for procedures range from 90-150 minutes as compared with diagnostic exam times ranging from 15-30 minutes. Because there is significantly longer amount of scanner time required for procedures, it can be challenging to find long open blocks in the schedule. However, keeping long blocks open in the schedule can lead to slots not being available for scans that require less time.
- c. The number of West Campus inpatients needing transport to the East Campus for a scan. The Applicant asserts that 1-3 times per month inpatients are transported to the East Campus for CT services. Additionally, there are outpatients who are scheduled in advance for a CT on the East Campus when their physician's appointment is on the West Campus though the Applicant does not track how many outpatients require a scan on the East Campus.
- d. Frequency of need for the radiology staff at BIDMC to reschedule appointments due to the needs of more urgent cases. CT scheduling for all BIDMC campus locations has evolved into an increasingly complex process as volumes have increased.

The Applicant reports that 3 to 10 patients (with the average of 6 patients) need to be rescheduled each month. Scheduling of CT services is complex. The Applicant adds that it requires intensive management and resources and must take into account multiple factors, including the longer appointment times of the various types of CT procedures being scheduled, the unique parameters of each CT unit and the hours of availability in general, as well as off-hours. Inpatients are scheduled by the lead technician working with a second technician; procedures may be scheduled by a senior technician, nurse coordinator, an interventional radiologist or fellow or even potentially someone from anesthesiology; and outpatients are scheduled by the call center. Rescheduling requires referring providers and

schedulers to expend substantial time to triage patients and fit in add-ons¹³ to an already full schedule. This is further exacerbated when a unit requires scheduled or unscheduled maintenance.

2. Increasing Acuity Of Ed Patients With changing protocols For Ct Scanning

As previously explained one of the West Campus' three fixed CT units is in BIDMC's ED (sited on the West Campus) and is dedicated for diagnostic exam use. ED patients often need urgent/emergent CT services as the protocols for all code stroke and trauma patients require CT scan. The volume of its ED patients overall (approximately 50,000 annually) and the increasing acuity of BIDMC's ED patients, creates challenges in scheduling ED CT services where the average wait time from order to ED CT exam is approximately 2.5 hours. When the dedicated ED CT is in use, patients must receive exams on one of the two units on the third floor unit. During the FY 2017-2019 time-period, there was a 148% increase in overflow ED patient use of the third floor units. However, ED access to the third floor units is limited by its schedule of lengthy CT-guided procedures and inpatient diagnostic exams.

3. Increasing Patient Census Increasing Along With Acuity For Inpatients

Inpatients comprise approximately 40% of the CT patient population. Inpatient CT uses include both procedures and exams. During the FY 2017-2019 time-period, there was 5.3% increase in the number of unique inpatients requiring CT scans. The volume of CT scans directly related to inpatients grew 6%, 3%, and 2% respectively for years 2017-2019. However, from 2014 to FY 2017, the volume of BIDMC inpatient CT scans performed increased 9-10% per year. The Applicant attributes this plateauing of CT inpatient growth in recent years to diminishing returns on its ability to improve efficiencies in scheduling CT units as they have reached capacity.

Total Inpatient Scan Volume(Exams and Procedures)								
								Percentage Growth
	2013	2014	2015	2016	2017	2018	2019	2017-19
Inpatient Scans	17,991	19,854	21,739	23,767	25,212	26,036	26,585	5%
% Change/Year		10%	9%	9%	6%	3%	2%	

Due to its status as an AMC, BIDMC is the referral center for the sickest patients who require the most complex care within BIDMC's network of health care providers. When appropriate, BILH and BILHPN affiliated community hospitals send their highest acuity patients to BIDMC, contributing to the increase in BIDMC's average patient acuity. During FY 2017-2019 time-period, BIDMC acuity was rising; it's Case Mix Index (CMI), which is considered an acuity measure, rose to 1.75 overall (and to 2.15 for age 65 and over). During this same period, the average daily census for all inpatients grew 5%. BIDMC's existing CT units on the West Campus are heavily used by inpatients due to patient acuity and the proximity of the CT suites to the inpatient nursing units, operating rooms, specialty

¹³ Add-on patients include (i) inpatients and (ii) outpatients that have an unscheduled need to be seen on campus that day (e.g. due to urgent need or patient convenience if patient lives far from the main campus).

centers, and the primary interventional radiology service site. As a result, BIDMC anticipates the additional CT in this location will be skewed towards inpatient CT services though it will also be available for use to expand the capacity for outpatient procedures and exams.

4. Increasing Clinical Applications Including For CT Guided Procedures

Technological advances, and additional clinical applications and techniques have led to an increase in the use of diagnostic exams and CT-guided procedures for both inpatients and outpatients, particularly on the West Campus. CT diagnostic exams include imaging of the head, neck, chest, abdomen, and musculoskeletal structures, including for cancer diagnoses, and more recently, a significant number of patients for cardiac diagnoses.

Many of the interventional procedures that previously could only be performed on inpatients are now deemed safe to perform as outpatients due to those advances in technology which have made them minimally invasive and have eliminated the need for general anesthesia.¹⁴ ~~CT-guided procedures include imaging of the head, neck, chest, abdomen, and musculoskeletal structures, and more recently, a significant number of patients with cardiac or cancer diagnoses.~~ The Applicant asserts ~~the~~that because of the expanding capabilities and the length of these procedures, the need for additional capacity is evidenced by the extended wait-times for appointments, depending on the procedure, as discussed herein.

Procedures								
	2013	2014	2015	2016	2017	2018	2019	Percentage Growth 2017-19
Procedures								
Inpatient	316	393	450	524	612	684	776	27%
Outpatient	568	566	597	767	830	828	913	10%
Total	884	959	1,047	1,291	1,442	1,512	1,689	17%

Consistent with the increasing acuity makeup of BIDMC’s inpatients, the number of CT-guided procedures has doubled from FY13 to FY19, and has increased 17% during the FY 2017-2019 time-period, from 1442 to 1689. BIDMC has seen an overall increase in CT combined use for ~~the following interventional procedures: head CTs, head and neck CTs, angiograms (CTAs), abdominal CTs, and chest CTAs. This coincides with growth BIDMC has experienced in both diagnostic exams and interventional radiology procedure volume which the Applicant notes has increased by 33 procedures of 31% since FY13, and 8% during the FY-2017-2019 time period, respectively from 209 procedures to 279~~17-FY19.

¹⁴ This is discussed further under *Public Health Value*

5. The Overall Prevalence Of Diseases Where CT Is An Important Diagnostic Or Treatment Modality

CT is a well-established technology that enables clinicians to appropriately diagnose and develop the most effective treatment plans earlier in the disease process across a number of clinical specialties including those which the Applicant anticipates are the most likely users for this unit such as oncology and cardiology. The Applicant indicated that there are long wait times for diagnostic and treatment appointments for patients with these acute diseases, citing a 10-15 day wait time for a procedure for cancer diagnosis and a 6 week wait for a cancer treatment appointment.

Staff's research notes the following:

- Cancer is the leading cause of death in Massachusetts with a mortality rate of 155.5/100,000 in 2014. Cancer incidence over the 2011-2015 timeframe was 459.4 per 100,000,^a which is higher than the national average.^b Advancing age is the most important risk factor for cancer. According to the National Cancer Institute, 83.2% of new cancer cases are diagnosed in people aged 45-84, with one quarter of new cancer cases being diagnosed in people aged 65-74. The median age for a cancer diagnosis is 66 years.^c As the population ages, and with it BILH's patients' risk for cancer, the demand on the CTs are expected to increase.
- Cardiovascular disease is the second leading cause of death in Massachusetts. From 2013-2015, adults diagnosed with myocardial infarction annually ranged from 5.2-5.7%, and those diagnosed with angina/coronary heart disease from 4.7-5.8%.^d

6. Growing Population Of Those Over Age 65 Whose Prevalence Of Those Diseases Increases With Age

Inpatient and outpatient scan volume is also increasing due to the increase in the older adult population who have more acute needs and, thus, greater utilization of CT services. As previously noted, the BIDMC CMI is higher in the 65 and over age cohort, 2.15, while the overall BIDMC CMI for all ages is 1.75. Reflective of this, as the 60-79 age cohort has grown 10% per year, CT service volume has increased 6% per year among the cohort. Given the patient population between the ages of 45-64 represents about 24% of the patients receiving CT services, BIDMC expects that the population of patients over the age of 65 receiving CT services to continue to grow, particularly as this population has a greater need for both cancer interventional services and cardiac imaging than the general population.

The Applicant notes that as BIDMC's patient panel ages the complexity and volume of imaging would be expected to increase accordingly. It adds that images of patients in these age groups tend to have more motion degradation, artifact from implanted devices (e.g., joint replacements and pacemakers), and difficulty with breath-holding. The planned newer, more advanced scanner is better at addressing all of these issues than older CT equipment.

The Applicant asserts that the combination of the above six interrelated issues demonstrates the needs of its patient population, and are illustrative of both the wide array of CT services that are

required by an academic medical center to provide access to comprehensive services for its entire patient panel, and the lack of sufficient current capacity to provide needed services.

Current and Projected Volume

The table below depicts the Radiology Department’s scan activity for in and outpatient scans and procedures over an extended period. The table below shows the tapering off in procedure growth which the applicant attributes to its units being at capacity and unable to add more volume.

The Applicant reports that projected CT Scan volume is based on BIDMC’s historic growth that has been at ~3% per year over the past three years. It adds that the proportion of exams within each age bracket has been relatively stable over multiple years. When Staff inquired about the impact of COVID-19 on the projections, it stated that initially there was an increase in scans for older patients since they were disproportionately affected, and now it is seeing an uptick in younger populations. Consequently, it has not altered its projections at this time.

Current and Projected use of CT at BIDMC West*					
	2019	Year 1	Year 2	Year 3	Year 4
	(Actual)	(Projected)	(Projected)	(Projected)	(Projected)
BIDMC	65,562	67,529	69,555	71,641	73,791
3% annual growth assumed for all types of exams and procedures					
*In and outpatient exams and procedures					

Analysis

Through the Proposed Project, BILH will be able to meet the current and near future¹⁵ needs of the Patient Panel at BIDMC by providing increased access to timely CT services for BIDMC patients. The proposed additional CT unit is expected to reduce the inconvenience to patients of off-hours utilization, reduce wait times, and relieve pressure in scheduling all types of West Campus procedures and exams while continuing to ensure that the most emergent and time-sensitive procedures and exams be provided in a timely manner. BILH expects the additional CT unit at BIDMC to operate at full capacity (80%) within a short period of time after becoming operational.

Factor 1: b) Public Health Value, Improved Health Outcomes And Quality Of Life; Assurances Of Health Equity

The Applicant asserts that the expanded CT capacity will enable it to meet increasingly needed CT services through the availability of additional time slots from the faster, and more advanced

¹⁵ The Applicant specified that the current CT expansion would not meet the needs for the additional beds approved in 2019,- DoN # CG-18051612-HE

technology of the new unit. The Applicant posits that these advancements will contribute to improved health outcomes by reducing wait times to access services for needed scans which may expedite diagnosis and treatment of patients, potentially reducing complications and contributing to better health outcomes. The Applicant asserts that the Proposed Project will improve public health value through ensuring timely, appropriate access to CT services for primarily ED, inpatients, and interventional procedure patients, thereby improving both health outcomes and quality of life of the Patient Population in a number of ways as described below.

1. Improved Public Health Value- Outcomes

The increase in CT capacity, particularly with the addition of the newer-generation CT with enhanced capabilities, should decrease the time to procedure, which in turn will decrease the time to diagnosis and treatment, and for inpatients potentially reduce length of stay. For example, newer-generation CTs, such as the one that will be utilized in the Proposed Project, have cardiac imaging capabilities which have been shown to benefit cardiac patients who are difficult to image (e.g. obese, have irregular heart rates, and have high levels of coronary calcium or a previous stent or bypass graft), and provide additional information to help plan surgery in patients who have complex abnormalities from congenital heart disease. The newer CT also has enhanced functionality through metal artifact reduction algorithms that lessens their appearance on the scan thus creating a clearer CT image for the radiologist to interpret.

2. Public Health Value- Quality Of Life And Patient Experience

Through improved access, the most noteworthy improvement in the patient experience is the shortened time to exam/procedure and the elimination of the need for some patients to travel to the East Campus for their exams. Quality of life is impacted for patients who deal with the uncertainty of waiting for a needed procedure.

So as to ensure a better quality of life and patient, and since the aging population and associated medical conditions have been cited to justify the need for this unit, Staff inquired about whether the design of the space is age friendly. Benefitting the over 65 age cohorts as well as all patients, the Applicant cited the following elements relating to the design of the space, features of the CT unit, and procedures in place.

- The Applicants affirmed that the space, in keeping with all CT imaging suites throughout BIDMC which are ADA compliant and age friendly, will be as well; citing the need for those receiving procedures and inpatient bed access, that a wide opening no-threshold doorway, patient hoists for those with limited mobility, and safety straps to minimize risk of fall will be in place.
- On CT units, microphones and amplified speakers are a standard feature for patient communication given the high background ambient sound of CT scanners.
- The inpatient needing CT services are escorted in wheelchair or stretcher by hospital staff to and from the CT suite. Outpatients have the option of wheelchair escort from

the entrance of the building to and from the CT suite and then are assisted to the CT room and on and off the CT scan table by CT staff.

3. Public Health Value/Health Equity-Focused

BILH states it “has a covenant to care for the underserved and to work to address disparities in access to care. As evidence of that commitment, BIDMC provides medical services to patients regardless of their ability to pay.” The Applicant states that it is committed to serving the community regardless of an individual’s ability to pay, and does not discriminate based on ability to pay or payer source and that it strives to use a culturally appropriate lens to facilitate communication with, and understanding of, the patient experience. Further it states that BIDMC was one of Boston’s first hospitals with an Interpreter Services Department and has track record for expanding capacity and increasing resources to serve its increasing non-English speaking patient population. BIDMC accommodates patients’ need for interpreters 24 hours a day, seven days a week.

The Program includes: 1) translation services - through which in-house interpreters provide translation in ten different languages, and by request interpreters are arranged for over 70 additional languages which can be either in person or via phone/video.

2) BIDMC’s Cultural Competence Initiative - a program where BIDMC’s Interpreter Services staff offer in-service training to employees and clinical staff to focus efforts on providing care that recognizes and responds to differences in culture.

3) American Sign Language - BIDMC has tenured, nationally certified American Sign Language interpreters on staff, and also when needed uses certified per diem American Sign Language interpreters. To increase communication access for BIDMC’s Deaf and Hard-of-Hearing patients and their families, it has Sorenson videophones installed across the campus. Patients admitted to the hospital BIDMC can have personalized headsets with adjustable volume controls. For these efforts, in 2014 BIDMC received the Outstanding Organization of the Year award from the Massachusetts Commission for the Deaf and Hard of Hearing.

In Radiology, the CT units at BIDMC including the Proposed Project unit include a feature that allows for translated discussions for non-native English speaking patients during procedures, and an interpreter is available before and after the procedures to address patients’ medical questions.

Each year, BIDMC submits an interpreter services report to the Department. BIDMC’s Language Access and Assistive Services Plan was approved by the Department as part of the Applicant’s change of ownership determination of need.

Analysis

The Applicant anticipates that the addition of one CT at this site will provide its patients with improved access to high quality CT services, which will improve health outcomes and thereby, quality of life. Research indicates that delayed access to quality health care negatively affects patient satisfaction as well as health outcomes due to delays in diagnosis and treatment. Quality of life is

includes aspects of physical health, and delayed access to care can also decrease one's quality of life. As a result, staff finds that through the Proposed Project, BIDMC is likely to improve access to effective, high-quality imaging services, and thereby enhance patient satisfaction, health outcomes and quality of life for its patient population.

Staff notes that the Applicant demonstrates its commitment to ensuring health equity and improving access through its licensed clinic the Bowdoin Street Health Center and is a founding and participating member of Community Care Alliance (CCA) (which is described in Factor 2). For the aging population, and those who depend on public transport, access to CT services is likely improved through this project as the services will be easily reached via public transport for those in the Boston zip codes.

Staff finds that the Applicant has described a case for improved health outcomes and has provided reasonable assurances of health equity through its description of the LEP program. Staff notes that through standard conditions, the Applicant meets the requirements of the Department's Health Equity Program.

As a result of the above analysis, Staff finds that the Applicant has met the provisions Factor 1(b).

Factor 1: c) Efficiency, Continuity of Care, Coordination of Care

The Applicant reports that BIDMC is the community hospital for the patients receiving care at many primary care practices, clinics, and community health centers, providing culturally and linguistically appropriate care for the urban population that resides near BIDMC. BIDMC works in partnership with Bowdoin Street Health Center¹⁶, The Dimock Center, Fenway Health and its affiliate, Sidney Borum Jr. Health Services, Charles River Community Health, and South Cove Community Health Center.¹⁷ BIDMC works to ensure that these vulnerable residents have access to on-site specialty care and ancillary laboratory, radiology, mammography. The Applicant asserts the Proposed Project will allow for increased access to the high quality, coordinated care for these patients using its integrated medical records, data management tools and ACO.

Integrated medical records are a proven tool to efficiently and effectively improve quality of care and public health outcomes.^e BIDMC's integrated medical record ("EMR") is the primary linkage between community primary care providers, BIDMC's specialists, and Radiology. The EMR also allows authorized providers within and outside of the Applicant to access their patients' data, view their patients' records, and send progress notes back for improved continuity of care. BIDMC's radiologists have real-time access to a patient's comprehensive medical information, including medical history, lab results, and clinical notes while they are protocoling or reading a study. Once the radiologist report is complete, the EMR enables imaging results and information to be available to primary care and specialty physicians and is integrated into the patient's medical record which ensures that the BIDMC patient panel benefits from care coordination, better outcomes, and improved quality of life. The Applicant states that BIDMC's links to primary care providers are "vital to its success in providing vulnerable patients with continuity and coordination of care." Through its BIDCO connection, BIDMC providers receive data analysis, care and risk management tools that

¹⁶ Bowdoin Street Health Center is operated and licensed by BIDMC.

¹⁷ all of which are members of the Community Care Alliance.

include a Population Health Management Tool that helps primary care physicians monitor patients' health and manage chronic conditions. Further, as previously described BIDMC participates in the MassHealth ACO Program through BIDCO, part of BILHPN. Through the ACO Program, BIDCO is working to increase access to and to improve health care for its patients and BIDMC's Community Health Implementation Plan includes the goal of chronic disease management and reduced cancer disparities through improvements to access, to screening and to treatment. In summary, these primary care linkages will continue to improve care for BIDMC patients, including timely access to radiology services that will be the Proposed Project will provide.

Analysis

Staff concurs that with increased CT capacity, the provision of CT services is more efficient, and delays in diagnosis and treatment can be reduced. We note that as a level 1 trauma center, it is essential to have adequate capacity to attend to patients who have experienced such events as accidents, and strokes that require timely and efficient access to CT services while not delaying care to patients arriving for scheduled procedures and exams.

Integration of care through electronic medical records (EMR) systems provide primary care and specialty clinicians across a health system timely access to clinical test results, including imaging. Integration of these tools with the CCA affiliated community health centers in particular can improve efficiency of care delivery for the neediest patients within the patient population served. This helps to ensure that patients benefit from care coordination, better outcomes, and improved quality of life.

To assess the impact of the Proposed Project, the Applicant has provided several measures, including wait times to appointments and quality of care, which may indicate improved outcomes. Staff reviewed the suggested measures that will become part of the annual reporting to DPH. The measures are described in Appendix 1 below.

Factor 1: d) Consultation

The Applicant has provided evidence of consultation, with all government agencies that have licensure, certification, or other regulatory oversight, which has been done and will not be addressed further in this report.

Factor 1: e) Evidence of Sound Community Engagement through the Patient Panel

The Department's Guideline for community engagement defines "community" as the Patient Panel, and requires that at minimum, the Applicant must "consult" with groups representative of the Applicant's Patient Panel. Regulations state that efforts in such consultation should consist of engaging "community coalitions statistically representative of the Patient Panel."^f

To ensure appropriate community engagement, the Proposed Project was presented to BIDMC's Community Advisory Committee (CAC) and its Patient and Family Advisory Committee (PFAC).

The CAC was established in connection with the New Inpatient Building Community-based Health Initiative ("CHI") process. Radiology presented the Proposed Project to the CAC on July 23, 2019. CAC

members had few questions and supported combining the CHI funds for this Application with the CHI process for the DoN approved New Inpatient Building.

The PFAC is comprised of a group of patients and family members who volunteer their time each month to provide BIDMC input that helps improve BIDMC's care with a focus on quality, safety, and communication at the hospital. Radiology presented the Proposed Project to the PFAC on January 8, 2020. At that meeting, there was a robust dialogue with the PFAC patient and family members in attendance. The PFAC was engaged and asked critical questions about the Proposed Project, many of whom expressed strong support of the Proposed Project. The discussion was about the operational need for the additional CT unit that included the need for back-up CT resources when West Campus ED unit is down, why the expanded schedule with BIDMC's existing CT equipment is not an adequate solution, and the current access and wait time for CT services. In its support for the Proposed Project, the PFAC also questioned whether only one new CT unit was sufficient for BIDMC to meet the patient panel needs. Radiology representatives expressed their belief that the Proposed Project would allow BIDMC to meet its goals over the new few years, and it would continually assess the impact of the Proposed Project while making annual reports to the Department.

Analysis

Staff reviewed the information on the Applicant's community engagement and finds that the Applicant has met the minimum required community engagement standard of Consult in the planning phase of the Proposed Project.

Factor 1: f) Competition on Price, Total Medical Expenses (TME), Costs and Other Measures of Health Care Spending

The Applicant states that the Proposed Project of adding one CT unit on the West Campus will help BIDMC to continue to compete with its peer academic medical centers on the basis of price, total medical expenses (TME), costs and other measures of health care spending, and that it would not impact BIDMC's contracted rates for CT services. Further, it asserts the following in support of this conclusion:

1. relative to other AMC's, BIDMC's costs are lower.
2. additional CT raises little to no risk of excessive or inappropriate utilization & is cost effective
3. increased capabilities and capacity improves outcomes and operating efficiencies
4. proposed project has been planned to minimize capital costs

1. BIDMC is a lower cost provider of tertiary and quaternary services, and is a community hospital provider to vulnerable patients in its community based service area. BIDMC supports the Commonwealth's goals of managing cost growth and total health care expenditures with its lower than average CMI adjusted cost per discharge. In FY 2016, the average CMI-adjusted cost per discharge for hospitals in Massachusetts was \$11,483, based on the CMS cost report issued in October 2017. BIDMC's CMI-adjusted cost per discharge had the lowest adjusted cost per discharge overall, of \$8,069. According to the HPC's 2019 Cost Trends Report, even with BIDMC's status as a Boston-based academic medical center, annual medical spending for patients of BIDCO in 2017 (the

most recent data) was similar to, and in many cases lower than, the patient spending rate of smaller and/or community-based health care systems.⁵³

2. Additional CT raises little to no risk of excessive or inappropriate utilization & is cost effective.

The Applicant asserts the expanded CT utilization will be primarily targeted for patients for whom CT is a necessary and integral component of hospital-based care: inpatients and patients in need of CT-guided procedures. The Applicant notes that for these cases CT services are not separately billable, rather the service is included as a component of the inpatient stay or is integrated as part of an intervention, thereby minimizing risk of inappropriate or overutilization. As described in Section F.1.b, oncology and cardiac uses are the primary drivers for the proposed acquisition of the CT unit on the West Campus.

As described under *Public Health Value - Outcomes*, by virtue of its advanced technology, CT is an essential interventional imaging tool,¹⁸ providing real-time visual information that precisely targets the area of concern less invasively. As a result, due to reduced complications and faster recovery times, outcomes are improved and then costs reduced through lower health care resource utilization.

When a CT unit is used for a limited amount of outpatient diagnostic imaging, best practices and standards of care are utilized to ensure that CT imaging is used appropriately. As discussed herein, the tools for appropriate use, the AUC and CDSMs (clinical decision support mechanisms) that BIDMC is implementing are also useful for prevention of unnecessary utilization and can also reduce costs by lowering volume of scans

The Applicant further addressed the issue of the potential cost increases referenced in studies suggesting “low value” and overutilization of certain high technology imaging, citing the Health Policy Commission’s 2018 Cost Trends report.^g The HPC lists three CT exams considered under “low value care”: (1) Sinus CT for simple sinusitis, (2) abdominal CT, with and without contrast, and (3) thorax CT, with and without contrast. The Applicant reports the first and last of these CT exams are rarely used at BIDMC. It stresses that there are valid indications for abdominal CT studies and that while they represent a low percentage of total CT service volume, some are performed at BIDMC.

The Applicant affirms that BILH and BILHPN, and through them BIDMC and BIDCO, are focused on ensuring the health system’s status as a lower cost, high value provider, and the most recent cited data reports confirms this. It highlights that BIDMC’s ACO affiliate BIDCO has performed well at avoiding unnecessary medical expenses according to a 2017 HPC analysis of unnecessary pre-operative tests which shows the BIDCO rate was lower than most other provider systems of all types (25.4% as compared with the average of 26.7 %).^h Total per-member spending on several low value care measures by BIDCO was below several other large systems, exceeding safety net, community-based health care systems and some smaller providers.ⁱ

3. Increased capabilities and capacity improves outcomes and operating efficiencies.

¹⁸ providing high quality resolution, magnification, and the ability to employ and detect injectable contrast in the target site

The Applicant states that by addressing Patient Panel access to CT services, wait-times should improve and hospital resources should be used more efficiently, thereby reducing unnecessary health care spending from a variety of approaches, as previously discussed. According to the Institute for Healthcare Improvement, “The results of improving flow can include increased access, shorter waiting times, lower costs, and better outcomes.”^j

The previously discussed updated capabilities of the proposed CT unit has the potential to not only improve quality and outcomes but also lower costs. Of note are speed to improve efficiency and throughput, and artifact reduction can reduce repeat scans. Such qualities are particularly important to seniors who are more likely to be sensitive to anesthesia, may have metal joint implants, or to have cardiac diseases and cancer, the two disease categories this unit is targeting for use..

4. Proposed project has been planned to minimize capital costs,

Additionally, the Applicant adds that both the proposed site and the unit to be acquired are cost effective. As described under Factor 1, the CT being acquired is a multi-functional unit that is adaptable for general diagnostic purposes, and expanded interventional capabilities.

The placement of the proposed unit in proximity to the other West Campus CT units is the most cost effective option available to Applicant (refer to F5.a.i). The Proposed Project will be implemented within existing space, minimizing additional build out and disruption of existing services. Moreover, it will be adjacent or convenient to related ancillary facilities, services and functions on the West Campus.

In sum, the Applicant argues that the Proposed Project will allow BIDMC to continue providing high quality, complex treatment at an economical value, enabling it to continue to compete with other academic medical centers, while supporting the shared goal of lowering total medical expenses in the Commonwealth. Further it asserts that BIDMC must be able to ensure timely access to treatment in order to continue to provide its patient panel with the highest quality care while also meeting the Commonwealth’s cost containment goals.

Analysis

Staff finds that the Applicant’s arguments for the Proposed Project may contain or reduce its TME relative to other AMCs. As stipulated by the Applicant, the project is planned in a cost effective manner siting it in existing space (through relatively minor renovations) and in proximity to its most likely patient users the inpatient nursing units. The versatile advanced technology units capabilities may reduce costs through speed and as a result of artifact correction capabilities, a reduction in repeat scans, while improving access to mainly cardiac and cancer inpatients and specialty outpatient procedures that are not generally billed separately.

As a result of the information provided by the Applicant, and additional analysis Staff finds that with the standard reporting requirements outlined below the requirements of Factor 1 have been met

Factor 2: Health Priorities

In this section we assess whether the Applicant has demonstrated that the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment, improved public health outcomes, and delivery system transformation.

Cost Containment:

The Applicant asserts that “the Proposed Project will meaningfully contribute and further the Commonwealth’s goals of ensuring resources will be made reasonably and equitably available to every person at the lowest reasonable aggregate cost, creating an accountable health care system that ensures quality, affordable health care for Massachusetts residents.”^k As an essential component of high value inpatient and hospital care delivered on the BIDMC campus, it also asserts that the Proposed Project will ensure the appropriate complement of, and access to CT services on the West Campus that will enable BIDMC to continue to compete with other academic medical centers on the basis of price, total medical expenses (TME), costs and other measures of health care spending.

As discussed in Factor 1 above, The Applicant states the Proposed Project will not impact BIDMC’s contracted rates for CT services and will not increase costs since it will primarily be utilized for inpatients, where risk of excessive or inappropriate utilization, is lowest, and for whom CT services provide a necessary and integral component of patient care. Additionally, with timely access to imaging services, recovery times^l may be faster. Overall, less clinical resources should be spent on patient care and administrative resources drained from juggling patients for the limited number of slots, therefore costs per episode of care may decline. As a result, the Proposed Project may lower costs, as well as overall TME and total health care expenditures, and meaningfully contribute to the goal of cost containment of the Commonwealth.

Public Health Outcomes:

The Applicant asserts the Proposed Project may improve public health outcomes as patients will have timely access to CT services, reducing delays in diagnosis and leading to earlier treatment. As a result, it will provide a better patient care experience due to timelier scheduling of CT services, further improving public health outcomes.

Finally public health outcomes may improve, the Applicant asserts, for the limited number of standalone outpatient diagnostic exams performed using the additional CT unit by ensuring appropriateness of each order. Each will be reviewed according to established protocols. First, the radiology order will go into BIDMC’s Financial Clearing Unit (FCU) to check for preauthorization and medical necessity. Second, Radiology will screen the order to ensure appropriateness with the implementation of its electronic clinical decision support tool. Further, BIDMC will implement the Medicare Part B Appropriate Use Criteria for Advanced Diagnostic Imaging in time for the 2022 start date.^m This program was initially set to go into effect in 2020, but has been delayed until 2022 due to the COVID-19 pandemic.

Delivery System Transformation:

The Applicant states that the Radiology Service screens for [Social Determinates of Health \(SDoH\)](#) and works with the Social Work Department to address transportation issues for outpatients who need to access necessary CT services, however its commitment to improving the health status of the communities it serves extends much further than this.¹⁹ BIDMC evaluates and manages the health of the population it serves through assessing SDoH, providing care coordination, and referrals. It provides numerous community health initiatives and supports, many in conjunction with its community partners such as the Community Care Alliance, and via the BIDCO's MassHealth ACO, through the other BIDCO members as well.

The Community Care Alliance (CCA) was founded by BIDMC and it continues to be an active participant in CCA health centers. The five CCA health centers are located in Boston. They serve 100,000 patients annually providing SDOH assessments, referrals and coordination of care, and some services addressing SDOH. They also support numerous educational, outreach, and community-strengthening initiatives. By offering culturally responsive, community-based primary care with integrated behavioral health and social services, these health centers provide a safety net for those underserved populations who face existing barriers and obstacles to accessing care, are disenfranchised, underinsured, or uninsured. The Applicant asserts that through collaboration with these health centers which are integral to BIDMC's community health implementation strategy, their outreach to underserved cohorts improves access to primary care and specialty care, with BIDMC serving as a clinical and academic acute care resource for the health centers. As an example, during the height of the COVID-19 pandemic, the health centers provided critical services, with three serving as testing sites in communities that were disproportionately impacted, and with all the health centers providing timely access to not only health care, but also resources such as food and personal protective equipment (PPE) for community residents.

BIDMC participates in BIDCO's MassHealth ACO program. For patients admitted to BIDMC for acute care services there is a Post-Acute Care Transition (PACT) Team that identifies and addresses SDOH issues. The PACT team is comprised of nurse care managers, pharmacists, and community resource specialists, who conduct face-to-face SDOH assessments, evaluations and referrals, with BIDCO's MassHealth ACO patients during hospitalizations, and follow their care for 30 days post discharge, thereby improving coordination of care.

Additionally, for outpatients a tool called Protocol for Responding to and Assessing Patients' Assets, Risks and Experiences (PRAPARE) is designed to screen MassHealth patients for SDOH needs. PRAPARE is being implemented initially at two of BIDMC's outpatient partners, Bowdoin Street Health Center,²⁰ and HealthCare Associates (HCA).

HCA is BIDMC's on-campus community physician practice. Its primary care physicians screen patients for SDOH as follows. HCA's front desk staff is prompted to provide the screening tool to patients annually at the time of check-in. The screening tool queries patients on the following: 1) SDOH that they have not been able to access in the past year, 2) their current housing situation, 3)

¹⁹ This response does not describe BIDMC's relevant efforts in this area in connecting with the Boston Collaborative and community-based health initiatives, which are reported separately to the Department.

²⁰ A Community Care Alliance member

transportation issues, 4) access or lack of access to community and family supports, and 5) safety concerns at home or with family. It then provides an opportunity for them to request help generally. There is a Community Resource Team specialist available to support patients who have identified needs and connect them with available resources. The SDoH screening process began as a pilot for HCA's MassHealth ACO population. HCA began screening its entire Medicaid population in spring 2020, surveying for all HCA patients will follow.

Analysis

Throughout the Application the Applicant has emphasized the burden on the patients and on the providers of the lack of adequate CT resources through the long wait- times, the need for BIDMC to reschedule patients or requiring that they travel to another site who in some cases are already prepped for a procedure, which may include fasting prior to a procedure. Having sufficient capacity for a level 1 trauma center and an Academic Medical Center to treat high acuity patients with the most appropriate resources is paramount to their ability to provide the most effective, timely care and to continue to compete at the AMC level. Ultimately, cost savings are achieved through efficient timely access to services for inpatients and outpatients needing interventional procedures, and those in the ED needing immediate exams for traumatic events²¹, while assuring appropriate use for those exams that are separately billable events. The applicant has provided adequate assurances that the new unit will be used with sufficient guardrails to ensure appropriate scan use, while ensuring access to its most vulnerable populations through CCA and HCA and other initiatives.

As a result of information provided by the Applicant and additional analysis, staff finds that with the standard reporting requirements outlined below, the Applicant has demonstrated that the Proposed Project has met Factor2.

Factor 3: Relevant Licensure/Oversight Compliance

The Applicant has provided evidence of compliance and good standing with federal, state, and local laws and regulations and will not be addressed further in this report.

Factor 4: Demonstration of Sufficient Funds as Supported by an Independent CPA

Analysis

Under factor 4, the Applicant must demonstrate that it has sufficient funds available for capital and operating costs necessary to support the Proposed Project without negative effects or consequences to the existing patient panel. Documentation sufficient to make such finding must be supported by an analysis by an independent CPA.

²¹ Such as stroke, MVAs, and head trauma

The CPA examined a range of documents and information in developing its report including historical financial information and 5-year financial projections prepared management.²²

The CPA reviewed the reasonableness of the assumptions used and feasibility of the Projections. This review included analysis of key metrics that fall into three categories: liquidity, operating and solvency.²³ The CPA states that in its opinion the analysis of key financial metrics is reasonable in relation to the company's past performance and peer group based on comparison to market information.

Revenue

The only revenue category that the proposed capital project would impact is net patient service revenue (NPSR). The CPA's analysis included the Applicant's net patient services revenue both historical and projected. The report looked at the projected 3.7% four-year compound annual total operating revenue growth rate (CAGR) between FY2021 and FY 2025 and found that it is below the historical CAGR between FY2017 and FY2019 of 6.1%. It excluded the performance for fiscal year 2020 in this comparison given it was significantly impacted by the global COVID-19 pandemic.

Based upon the foregoing, the CPA's opinion is that the revenue growth projected by Management reflects a reasonable estimation of future revenue of BILH.

Operating Expenses

The projections for operating expenses for the Proposed Project were reviewed in the context of actual operating results for BILH for the years ended December 31, 2017-2019.

The operating expenses in the analysis include salaries and benefits, depreciation and amortization, interest expenses, and supplies and other expenses. Total operating expenses are projected to grow 3.0 percent in FY 2021 as compared to FY2019. (FY 2020 was excluded given it was significantly impacted by the COVID-19 pandemic.) From FY 2022 through FY 2025, operating expenses are projected to grow annually by 3.3 percent. This is slightly below the FY 2017 to FY 2019 annual historical growth, which ranged from 4.2 percent to 5.2 percent. This, the Applicant asserts, is due to

²² 1. Financial Model for BILH for the periods ending September 30, 2021 through September 30, 2025; 2. Draft BILH Application Form for DoN Application, including narrative; 3. Audited Financial Statements for Beth Israel Lahey Health, Inc. for Fiscal Year Ended September 30, 2019 and September 30, 2019; 4. Audited Financial Statements for Caregroup, Inc., Seacoast Regional Health Systems, Inc. and Lahey Health Systems, Inc. for Fiscal Years Ended September 30, 2017 and 2018; 5. Beth Israel Lahey Health, Inc. draft patient volume tables for Fiscal Years Ended September 30, 2019 and 2018; 6. BILH's Fiscal Year 2021 Operating and Capital Budgets Finance Committee Presentation as of December 18, 2020; 7. BILH's Fiscal Year 2021 Budget for Growth in Patient Volume and Consolidated Statement of Revenue and Expenses; 8. RMA Annual Statement Studies, published by The Risk Management Association; 9. Definitive Healthcare data; 10. IBISWorld Industry Report, Hospitals in the US, dated January 2021;

²³ Liquidity metrics, measure quality and adequacy of assets to meet current obligations as they come due. Operating metrics, such as earnings before interest, taxes, depreciation and amortization ("Adjusted EBITDA") are used to assist in the evaluation of management performance in how efficiently resources are utilized. Solvency metrics, such as Debt to Equity, measure the company's ability to service debt obligations.

synergies as a result of the integration efforts following the formation of BILH,²⁴ thereby allowing it to operate more efficiently.

The CPA points out that the projected total operating expenses as a percentage of total operating revenue range from 98.4 percent to 99.8 percent from FY 2021 to FY 2025, and which is in-line with the historical total operating expenses as a percentage of total operating revenue which ranged from 98.8 percent to 101.5 percent from FY 2017 to FY 2019. Thus, it is the CPA's opinion that the projected operating expenses reflect reasonable estimation of future expenses of the Applicant.

Capital Expenditures and Cash Flows

The CPA report included a review of the projected costs related to the Proposed Project which totaled \$4.8 million. The total project costs include the cost of the CT unit and the associated renovations for the space for the unit.

In addition, it also reviewed the financing plans for the Proposed Project with the understanding that the expenditures related to the Proposed Project are expected to be funded through the Applicant's cash on hand. The CPA notes that the cash and cash equivalents balance included in the Projections is approximately \$1.43 billion in FY 2021, of which the cost of the Proposed Project represents approximately 0.3 percent and that based on their review of cash flows and cash on hand, there appears to be sufficient capital for internal financing of the Proposed Project.

CPA's Conclusion of Feasibility

As a result of its analysis the CPA states that *"within the projected financial information, the Projections exhibit a cumulative operating EBITDA surplus of approximately 7.5 percent of cumulative projected net patient service revenue for BILH for the five years from FY 2021 through 2025. Based upon our review of the relevant documents and analysis of the Projections, we determined the anticipated EBITDA surplus is a reasonable expectation and based upon feasible financial assumptions."*

Accordingly, it determined that the Projections are reasonable and feasible, and not likely to have a negative impact on the patient panel or result in a liquidation of assets of BILH.

Analysis

Staff is satisfied with the CPA's analysis of Applicants decision to proceed with the Proposed Project. As a result, Staff finds the CPA analysis to be acceptable and that the Applicant has met the requirements of Factor 4.

Factor 5: Assessment of the Proposed Project's Relative Merit

The Applicant has provided sufficient evidence that the Proposed Project, on balance, is superior to alternative and substitute methods for meeting the existing Patient Panel needs identified by the Applicant pursuant to 105 CMR 100.210(A)(1). Evaluation of 105 CMR 100.210(A)(5) shall take into

²⁴ From reallocating centralized service costs such as human resource, marketing/communications, information technology, etc., achieved from the integration of legacy health care systems.

account, at a minimum, the quality, efficiency, and capital and operating costs of the Proposed Project relative to potential alternatives or substitutes.

The Applicant considered three alternatives to the proposed project:

- 1) Maintaining the Status Quo
- 2) Placement elsewhere on BIDMC's main campus
- 3) Placement elsewhere off of BIDMC's main campus

The first alternative of maintaining the status quo by continuing to operate with the existing complement of CT units does not solve the problem that the Radiology Department has already attempted to solve through expanded hours of operation on the East and West campuses to accommodate current demand.²⁵ The Radiology schedule at both BIDMC East and West Campus operates at 80%, which is considered full capacity, in order to ensure access for emergency and urgent CT services and to accommodate required maintenance and CT downtime.

From a quality and efficiency perspective, the Applicant states that status quo is not a feasible solution, as existing need for services, wait times and patient experience would not be addressed and would continue to have a negative impact on both inpatients and outpatients. Requiring that certain patients with health and/or mobility limitations be transported to the East Campus poses risks for patients. Arranging transport and rescheduling patients is an added and inefficient use of staff time and an added expense. Further, it would not address the current wait time of for CT exams and procedures.

Options two and three stress that there is no acceptable alternative site for the Proposed Project elsewhere on BIDMC's main campus or within the system because placement on the East Campus or another location will not address the identified patient panel need that exists on the West Campus that includes addressing the demand for ED overflow, for inpatients, and for CT-guided procedures, which are only performed by BIDMC at the main campus.

Analysis

Staff adds that placement of the CT unit within an existing radiology suite that only requires renovation, not new construction, offering a cost-effective efficient means to expand the service using existing space, staff and infrastructure. Consequently, staff finds that the Applicant has appropriately considered the quality, efficiency, and capital and operating costs of the Proposed Project relative to potential alternatives. As a result of information provided by the Applicant and additional analysis, staff finds the Applicant has reasonably met the standards of Factor 5.

Factor 6: Fulfillment of DPH Community-based Health Initiatives Guideline: Overall Application

Summary and relevant background and context for this application: This is a Tier 1 project for which the Applicant will be pooling CHI funding with an existing larger project. The Applicant will be adding

²⁵ since May, 2017 from 5:00p.m. to 7:00 p.m., Monday through Friday

the required CHI resources to the Health Priority Strategies approved as part of CareGroup BIDMC DoN # CG-18051612-HE, approved in 2019. Pending DPH approval, the 'pooled funding' option is allowable, and in this case is the most efficient and reasonable course of action. The Applicant was not required to submit standard CHI application materials because the most recent community engagement and needs assessment processes are inclusive of to 2019 Approved Project and the current application.

In order to provide updates on engagement activities, the Applicant did provide an updated Self-Assessment and a Self-Assessment Narrative with supplemental information. These materials provide a summary of community engagement processes and socio-demographic information, data and highlights related to topics and themes of community needs. Through ongoing communication with their Advisory Committee, the Applicant has developed a plan to pool CHI funds for this application with funds for the health priority strategies identified through the project approved in 2019. The investments for this project support selected strategies in Housing, Employment and Financial Security, Behavioral Health, and Healthy Neighborhoods. The Housing priority focuses on Housing Affordability with strategies including to address homelessness, increase home ownership, and support rental assistance. The Employment and Financial Security strategies seek to support education and workforce development, increase employment opportunities, and enhance income supports. The Behavioral Health investment supports capacity building for communities and providers, and stigma reduction. The Healthy Neighborhoods funding stream will support collective action in priorities selected and driven by the priority communities.

The Applicant will continue to update DPH staff on lessons learned from existing investment strategies and will provide status updates at appropriate intervals.

Analysis

As a result of information provided by the Applicant and additional analysis, staff finds that with the conditions outlined below, the Applicant will have demonstrated that the Proposed Project has met Factor 6.

Findings and Recommendations

As outlined in the Project description and patient population need discussion, the Proposed Project will improve BIDMC's existing CT services by ensuring that BIDMC patients, including vulnerable patients in BIDMC's community service area, inpatients and outpatients in need of CT-guided procedures, have timely access to essential proven hospital-based imaging services from a historically lower cost provider of equal quality tertiary and quaternary services to AMC peer group. To determine need for the Proposed Project, BIDMC looked at patient acuity, historical usage data, capacity, and patient wait time. It also gained feedback from patients and clinicians about their experience with BIDMC's CT services which helped to confirm the need for the CT.

Based upon a review of the materials submitted, Staff finds that, in addition to the standard conditions, with the addition of the recommended conditions detailed below, the Applicant has met

each DoN Factor for the Proposed Project and recommends that the Department approve this Determination of Need, subject to all applicable standard and Other Conditions.

Conditions to the DoN

1. Of the total required CHI contribution of \$239,769.40

- a. \$23,017.86 will be directed to the CHI Statewide Initiative
- b. \$207,160.76 will be dedicated to local approaches to the DoN Health Priorities
- c. \$9,590.78 will be designated as the administrative fee.

2. To comply with the Holder's obligation to contribute to the Statewide CHI Initiative, the Holder must submit a check for \$23,017.86 to Health Resources in Action (the fiscal agent for the CHI Statewide Initiative).

- a. The Holder must submit the funds to HRiA within 30 days from the date of the Notice of Approval.
- b. The Holder must promptly notify DPH (CHI contact staff) when the payment has been made.

Assessing the Impact of the Proposed Project

Pursuant to 105 CMR 100.310(A)(12), annual ongoing reporting is required to DoN is required. In order to measure progress on the project, , staff recommends reporting metrics described in numbers 1, and 2 of Appendix 1 below. The Applicant will also report such measures as required by DPH- Bureau of Health Care Safety and Quality (BHCSQ) to DoN.

Appendix 1

To assess the impact of the Proposed Project, The Applicant will report the following quality metrics and reporting schematic as well as metric projections for quality indicators that will measure patient satisfaction and access.

1. **Patient Experience/Satisfaction:** Patients who are satisfied with care are more likely to seek additional treatment when necessary. Radiology will review overall assessment of care via Press Ganey survey ("Survey") scores.
 - a. **Measure:** The Survey's overall assessment has two inquiries: (1) How well staff worked together to provide care; and (2) The likelihood of patients recommending our facility to others. Response options include: Very Good, Good, Fair, Poor and Very Poor.

Projections: Baseline²⁶: 84 %; Year 1: 85 %; Year 2: 87%; Year 3: 89%

²⁶ The baseline measure will encompass FY2021 -- 12 months prior to implementation of the Proposed Project of patient satisfaction data for the current complement of CT units, and will be based on the first year of implementation of the Radiology Department's new Survey. Prior to implementation of the new survey in October 2019, the Radiology Department used a different survey format that did not generate any comparative data. The Year 1 measure will be based on the first year of implementation of the additional CT unit.

Monitoring: Radiology will review the Survey’s comments on a quarterly basis. Patients who report a negative experience and indicate that they wish to be contacted about their experience (and leave a name and number on the survey) will be contacted. Mean score trends are evaluated on a quarterly basis, and policy changes instituted as appropriate. This data will be provided on an annual basis.

2. Access- Wait Times²⁷: The Proposed Project seeks to ensure timely access to CT services. Accordingly, BIDMC will track on the West Campus the median time from order placement to the third next available appointment for outpatient CT-guided procedures, as well as the time from CT scanning to finalization of radiology report.

a. Measure: Average (median) time interval from the CT services request was initiated to the third next available appointment.

Projections: Baseline: 30 days; Year 1: 7-10 days; Year 2: 7-10 days; Year 3: 7-10 days²⁸

Monitoring: This data will be provided on an annual basis.

b. Measure: Average (median) time interval from the completion of a patient’s CT services on the West Campus to finalization of radiology report.

Projections: Baseline: 3 days²⁹; Year 1: 1-2 days; Year 2: 1-2 days; Year 3: 1-2 days

Monitoring: This data will be provided on an annual basis.

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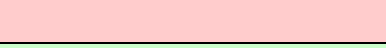



²⁷ The measures in Item 2 (Access-Wait Times) will be measured with “Year 1” beginning on the date which the applicable imaging unit is installed and fully operational for patients.

²⁸ This measure fluctuates based on the day of the week and time of day a request for a CT scan is made.

²⁹ This measure is based on Monday-Friday

Document comparison by Workshare 10.0 on Friday, October 22, 2021 2:07:16 PM

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Document 2 ID	iManage://DMS16/IMAN/757722/3
Description	#757722v3<IMAN> - BILH-BIDMC-CT Final Staff Report BILH-19092415-RE [applicant comments]
Rendering set	Standard

Legend:	
Insertion	
Deletion	
Moved from	
Moved to	
Style change	
Format change	
Moved deletion	
Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

Statistics:	
	Count
Insertions	15
Deletions	8
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Moved to	2
Style change	0
Format changed	0
Total changes	27

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- ^a Centers For Disease Control & Prevention, State of the State of Massachusetts
<https://www.cdc.gov/nchs/pressroom/states/massachusetts.htm>.
- ^b National Cancer Institute. State Cancer Profiles. Quick Profiles: Massachusetts. Age-Adjusted Incidence Rates by Cancer Site, All Stages (2012-2016)
<https://statecancerprofiles.cancer.gov/quick-profiles/index.php?statename=massachusetts>.
- ^c National Cancer Institute, Cancer causes and Prevention, Age and Cancer Risk, NCI Surveillance, Epidemiology and End Results program,
<https://www.cancer.gov/about-cancer/causes-prevention/risk/age>
- ^d BRFSS Statewide Reports and Publications. A Profile of Health Among Massachusetts Adults, by year.
<https://www.mass.gov/lists/brfss-statewide-reports-and-publications>
- ^e HealthIT.gov,
<https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/improved-diagnostics-patient-outcomes> (last updated June 4, 2019).
- ^f DoN Regulation 100.210 (A)(1)(e).
<https://www.mass.gov/files/documents/2018/12/31/jud-lib-105cmr100.pdf>
- ^g See HPC, *2018 Annual Health Care Cost Trends Report Chapter 4* (Feb. 2019), available at
<https://www.mass.gov/files/documents/2019/02/20/2018%20Cost%20Trends%20Report.pdf>.
- ^h HPC, *2019 Health Care Cost Trends Report: Select Findings*, slide 18, available at
<https://www.mass.gov/doc/slides-1142020-cost-trends-report/download>.
HPC, *supra* note 10, at slide 23.
- ⁱ *Id.* at slide 24.
- ^j Institute for Healthcare Improvement, *Optimizing Patient Flow: Moving Patients Smoothly Through Acute Care Settings*, at 3 (2003).
- ^k See 105 CMR 100.001; See also HPC, *2019 Annual Health Care Cost Trends Report*, available at
<https://www.mass.gov/doc/2019-health-care-cost-trends-report/download>; Hattis, *Massachusetts and its Approach To Health Care Cost Containment Since its Passage of its 2012 Law – Chapter 224* (Dec. 11, 2017), available at
https://www.assembly.ca.gov/sites/assembly.ca.gov/files/Archives/paul_hattis_powerpoint_presentation_massachusetts_and_its_approach_to_health_care_cost_containment.pdf.
- ^l ⁸⁰ See *supra* note 56.
- ^m Available at <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/AUCDiagnosticImaging-909377.pdf>. See also CMS, *Appropriate Use Criteria Program*,
<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Appropriate-Use-Criteria-Program>.