

STAFF REPORT TO THE COMMISSIONER FOR A DETERMINATION OF NEED	
Applicant Name	Baystate Health, Inc.
Applicant Address	759 Chestnut St Springfield, Ma 01199
Filing Date	November 23, 2022
Type of DoN Application	DoN Required Equipment
Total Value	\$1,218,286.00
Project Number	#-20121611-
Ten Taxpayer Groups (TTG)	None
Community Health Initiative (CHI)	\$60,914.30
Staff Recommendation	Approval
Delegated Review	Commissioner Approval
<p style="text-align: center;"><u>Project Summary and Regulatory Review</u></p> <p>Baystate Health, Inc. (Baystate Health or Applicant), with a principal place of business at 759 Chestnut Street, Springfield, MA 01199, filed a Notice of Determination of Need with the Massachusetts Department of Public Health to acquire a second computed tomography (CT) unit for operation at Baystate Noble Hospital (BNH or Hospital), located at 115 West Silver Street, Westfield, MA 01085 (Proposed Project).</p> <p>This DoN application falls within the definition of DoN-Required Equipment and Services, 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.</p>	

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Background: Baystate Health, Inc and Application Overview

The Applicant, Baystate Health, Inc., is a non-profit, integrated health care delivery system serving over 800,000 patients through a network of hospitals, physician practices, and community clinics in Western Massachusetts. Its member hospitals include Baystate Medical Center, Baystate Franklin Medical Center, Baystate Wing Hospital and Baystate Noble Hospital (collectively known as “BH Hospitals”). Baystate Health also includes a network of more than 80 medical practices, Health New England (a health insurance provider), home care and hospice services, and regional laboratory and diagnostic services.

Baystate Noble Hospital (BNH or the Hospital), is an 85-bed acute care community hospital that serves the Greater Westfield area. In addition to general medical and surgical inpatient care, the Hospital provides 24-hour emergency services and a complement of outpatient services that include diagnostic imaging, oncology, neurology, and inpatient rehabilitation services. The Hospital is a DPH-designated Primary Stroke Service, providing 24 hours a day, 7 days a week care to patients experiencing stroke and stroke symptoms.

Proposed Project

The Proposed Project would add a second CT unit to BNH in order to meet the needs of current and future patients by providing timely access to CT imaging. The additional unit will be centralized on the first floor of BNH, adjacent to the current unit and equidistant from the Hospital’s main entrance and emergency department, creating a CT hub. As a Primary Stroke Service, it is essential for BNH to ensure expedient access to CT for all Emergency Department patients in the service area. The Hospital’s existing CT operation is nearing capacity and increased instances of downtime delay diagnosis and treatment.

While renovation of 500 gross square feet (GSF) is required, there is no new construction associated with this Proposed Project.

Patient Panel¹

In Fiscal Year (FY) 2021², Baystate Health served approximately 317,791 patients, an increase of 13.65% from 2020. The Patient Panel data for FY2019-2021 and preliminary data from FY2022 are provided in Table 1 below.

¹ 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.

² For purposes of the Applicant and the Hospital’s Patient Panel, the fiscal year is defined as October 1 through September 30.

Table 1: Baystate Health Patient Panel Unique Patients Served

FY2019 (Apr. 1-Sept. 30)³	FY2020	FY2021	FY2022⁴
204,491	279,634	317,791	204,913

The Applicant provided demographic data for the Patient Panel, which is presented in Table 2. Staff notes the following observations about these data below:

- **Age:** Baystate Health served relatively equal percentages of patients in the 19 to 65, 46-54 age cohorts (~28% each). Staff notes that over 26% of the Patient Panel is over 65 years old.
- **Race/ Ethnicity:** The majority of Baystate Health's patients self-identified as White (67.24% in FY2021). Hispanic (20.36% in FY2021) and Black or African American (6.95% in FY2021) represented the next largest Race/ Ethnicity groupings in the Patient Panel.
- **Payer Mix:** Approximately 32.92% of patients were covered by Medicare Fee for Service ("FFS") in FY2021; followed by ~30% commercially insured patients. Over 17% of patients were covered by commercial Medicare. MassHealth and Medicaid patients represent just over 12% of the Patient Panel.

Table 2: Overview of Baystate Health Patient Panel, FY2021 and FY2022

	FY2021 Totals	FY2022⁵ Totals
Total Unique Patients	317,791	204,913
Gender		
Female	57.68%	59.17%
Male	42.32%	40.83%
Total	100.00%	100.00%
Age		
0-18	16.34%	17.15%
19-45	28.84%	27.80%
46-64	28.23%	28.26%
65+	26.59%	26.80%
Total	100.00%	100.00%
Ethnicity Grouping		
American Indian or Alaska Native	0.09%	0.09%
Asian	1.30%	1.39%
Black or African American	6.77%	7.37%
Hispanic	19.46%	22.33%
Native Hawaiian or Other Pacific Islander	0.07%	0.06%
Other	0.01%	0.00%
Refuse to Answer	0.32%	0.22%
Unknown	4.74%	2.98%
White	67.24%	65.56%
Total	100.00%	100.00%

³ Fiscal Year 2019 data for the Applicant and the Hospital's Patient Panel is based on an incomplete year, defined as April 1, 2019 - September 30, 2019, due to Baystate Health's change to a new medical record system. The two disparate systems result in the inability to identify unique patients without duplication. To prevent duplication of records, data is provided from April 1, 2019, through September 30, 2019.

⁴ Fiscal Year 2022 data covers October 1, 2021 – March 31, 2022.

⁵ Fiscal Year 2022 data covers October 1, 2021 – March 31, 2022.

	FY2021 Totals	FY2022 ⁵ Totals
Payer Mix		
Commercial PPO/Indemnity	20.10%	19.00%
Commercial HMO/POS	10.37%	10.71%
MassHealth	9.60%	10.04%
Managed Medicaid	3.06%	2.98%
Commercial Medicare	17.82%	18.43%
Medicare FFS	32.92%	32.49%
All Other ⁶	6.14%	6.36%
Total	100.00%	100.00%

Table 3 below presents information for BNH's patient population, the Hospital targeted for this DoN Application. Some highlights from the data include:

- **Age:** BNH had a slightly higher proportion of patients 65 and older than the overall Patient Panel (29.61% in FY2021 at BNH compared to 26.59% in FY2021 for the overall Patient Panel).
- **Race/ Ethnicity:** BNH had more patients self-reporting as White than the overall Patient Panel (81.04% in FY2021 at BNH compared to 67.24% in FY2021 in the overall Patient Panel). BNH patients self-identified as other races/ethnicities at significantly lower rates than the overall Patient Panel: Hispanic (10.27% in FY2021 at BNH compared to 19.46% in FY2021 in the overall Patient Panel); and Black/African American (3.55% in FY2021 at BNH compared to 6.77% in FY2021 in the overall Patient Panel).
- **Patient Origin:** The majority of BNH's patient population (77.53% in FY2021) are from the cities and towns of Westfield, Southwick, Agawam, Springfield, West Springfield, Russell, and Chicopee.
- **Payer Mix:** BNH's Payer Mix was very similar to the overall Patient Panel with approximately 31.42% of patients covered by Medicare Fee for Service (FFS) in FY2021; followed by approximately 30% of patients who had commercial insurance. MassHealth and Medicaid patients represent approximately 12% of the patient population, and 18.2% of patients were covered by commercial Medicare in FY2021.

Table 3: Baystate Noble Patient Population, FY2021-FY2022

	FY2021 Totals	FY2022 Totals
Total Unique Patients	31,920	21,556
Gender		
Female	57.61%	58.74%
Male	42.39%	41.26%
Total	100.00%	100.00%
Age		
0-18	7.07%	7.17%
19-45	30.26%	29.16%
46-64	33.06%	32.63%
65+	29.61%	31.04%
Total	100.00%	100.00%

⁶ "All Other" is defined as and incorporates Medicaid- Other; Noninsurance payors; QHP-Connector Plans; and Self-pay/free care.

	FY2021 Totals	FY2022 Totals
Ethnicity Grouping		
American Indian or Alaska Native	0.08%	0.09%
Asian	1.32%	1.33%
Black or African American	3.55%	3.45%
Hispanic	10.27%	11.08%
Native Hawaiian or Other Pacific Islander	0.06%	0.06%
Other	0.03%	0.00%
Refuse to Answer	0.28%	0.27%
Unknown	3.38%	2.69%
White	81.04%	81.02%
Total	100.00%	100.00%
Patient Origins		
Westfield	47.66%	47.37%
Southwick	9.35%	10.02%
Agawam	3.12%	9.03%
Springfield	8.75%	7.01%
West Springfield	4.64%	4.85%
Russell	1.49%	2.02%
Chicopee	2.52%	1.99%
Granville	1.26%	1.50%
Huntington	1.76%	1.47%
Holyoke	1.16%	1.44%
Chester	0.96%	1.29%
Blandford	0.93%	1.23%
Southampton	0.60%	0.63%
Easthampton	0.99%	0.57%
East Longmeadow	0.60%	0.48%
All Other	14.21%	9.10%
Total	100.00%	100.00%
Payer Mix		
Commercial PPO/Indemnity	20.39%	20.19%
Commercial HMO/POS	10.75%	11.34%
MassHealth	7.24%	7.48%
Managed Medicaid	5.17%	5.59%
Commercial Medicare	18.20%	19.39%
Medicare FFS	31.42%	29.80%
All Other ⁷	6.83%	6.22%
Total	100.00%	100.00%

⁷ "All Other" is defined as and incorporates Medicaid- Other; Noninsurance payors; QHP-Connector Plans; and Self-pay/free care.

Factor 1: a) Patient Panel Need

In this section, staff assesses if the Applicant has sufficiently addressed Patient Panel need for the Proposed Project.

Patient Panel Need

The Applicant attributes the need for a second CT machine to two factors:

- 1) Capacity limitations of one CT unit
 - a. Increased Downtime for CT Equipment Maintenance
 - b. Primary Stroke Service Hospital
- 2) Projected Increase in Demand

1) Capacity Limitations of One CT Unit

As Table 4 below demonstrates, BNH experienced a significant increase in CT utilization for inpatient, outpatient, and emergency patients. Most of this volume originated from the Hospital's Emergency Department which accounted for 54% (26,694 total scans) of all CT scans at the Hospital from FY2019-FY2022.

Table 4: Baystate Noble Hospital Historical CT Scan Volume

Department Referring for CT	FY2019 Scans	FY2020 Scans	FY2021 Scans	FY2022 Scans ⁸	Percent Growth in CT Scans FY2019-FY2022
Inpatient	1,429	1,368	2,352	2,517	76%
Outpatient	2,476	3,066	4,617	4,800	94%
Emergency Department (ED)	6,096	5,352	7,280	7,966	31%
Total	10,001	9,786	14,249	15,283	53%

With one unit, urgent or emergent CT cases delay inpatient CTs and can disrupt the outpatient schedule. With an average CT scan taking approximately twenty minutes, BNH has capacity to perform three CT scans per hour. This time includes prepping the room, inserting an IV, positioning the patient, performing the scan, cleaning the room, and processing the images. BNH currently has one CT unit for inpatient, outpatient, and ED needs. With only one CT unit, BNH cannot perform CT- guided procedures without impeding access to CT imaging for stroke and ED patients. As a result, patients requiring CT- guided procedures are transferred to Baystate Medical Center in Springfield.

A.) Increased Downtime for CT Equipment Maintenance

An increase in CT scan volume with only one CT unit to complete the scans has led to an increase in the need for CT equipment maintenance. Downtime to perform CT equipment maintenance leaves the Hospital without CT capability. Table 5 illustrates that between FY20 and FY21 there was a 61% increase in downtime hours for the Hospital's unit.

Table 5: Baystate Noble Hospital Historical CT Scanner Downtime

	FY2020	FY2021	FY22 through July
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⁸ Data for FY2022 was only available to May. The data listed is annualized based on the available data.

Total downtime hours for existing CT	77	124	81.25
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When the unit experiences downtime, patients must wait, be rescheduled, or transfer from BNH to Baystate Medical Center in Springfield. These transfers increase the volume to Baystate Medical Center's already busy ED and impacts the ED flow. As a result, Baystate Medical Center's inpatient and ED patients are delayed access to CT imaging, which the Applicant states negatively impacts the health care and health outcomes of Baystate Medical Center's patients. During CT downtimes, BNH has Emergency Medical Services (EMS) onsite on standby in the event that a patient requires transport for CT imaging at Baystate Medical Center. The Applicant notes that, due to BNH's reputation of frequent CT downtimes, the EMS often continues to redirect ED patients to other hospitals even after the CT comes back online at BNH. The Applicant asserts that increased downtime for maintenance and repairs, and the likelihood that the existing scanner will increasingly require maintenance downtime as it ages, are evidence of the need for a second CT to provide redundancy when one unit is offline.

B.) Primary Stroke Service Hospital

DPH designates BNH as a Primary Stroke Service (PSS) Hospital⁹, which means the EMS will send patients experiencing symptoms of a stroke to the BNH ED. Clinical guidelines for stroke recommend that patients receive CT imaging within 25 minutes of arrival at the ED.^a Acute stroke patients, and other patients requiring an emergent CT scan are prioritized over less urgent exams on other patients. When an emergency CT is needed, all other patient scans are delayed. As demonstrated in Table 6 below, BNH experienced a 28.14% increase in the number of stroke patients presenting to its ED between Calendar Year (CY)2020 and CY2022 annualized. The Applicant notes that expected growth was not realized between CY21 and CY22 due to CT downtime and unreliability of the unit, resulting in the EMS system diverting stroke patients to other hospitals.

Table 6: Baystate Noble Hospital Stroke Patient Volume

	CY2020	CY2021	CY22 Annualized
Number of Stroke Patients	231	326	296

2) Projected Increase in Demand

Based on historical volume and projections for future demand, BNH expects CT volume will continue to grow as the Hospital's Primary Service Area experiences sustained growth over the coming years. The population in BNH's service area is projected to increase by 4.5% from 2020 to 2040.^b In particular, the population aged 65 and older in the service area is expected to grow by 34% from 2020 to 2040.^c As a geriatric accredited ED, BNH will continue to attract geriatric patients from the surrounding areas. As

⁹ To be designed a PSS Hospital, a hospital must be equipped to readily provide timely acute stroke evaluation and treatment, and "must provide emergency diagnostic and therapeutic services 24 hours-a-day, seven days-a-week to patients presenting with symptoms of acute stroke." *Primary Stroke Service validation*, <https://www.mass.gov/info-details/primary-stroke-service-pss-validation> (last visited Feb. 24, 2022). Also see *Designated Primary Stroke Services Hospitals*, <https://www.mass.gov/info-details/designated-primary-stroke-services-hospitals> (last visited Feb. 24, 2022).

the Patient Panel ages, the Applicant asserts that BNH patients will present with higher acuity and more frequently require advanced diagnostic imaging, including CT. The Applicant states that between FY18 and FY21, there was a 33% increase in percentage of patients presenting to the ED with a Class 4¹⁰ acuity. Such patients often present to the ED with conditions that require utilization of CT for diagnosis, such as stroke and trauma. Table 7 demonstrates the Applicant's projected increase in CT Scan volume¹¹, indicating a 40.31% projected increase from the FY2021 scan volume of 14,249.

Table 7: Baystate Noble Hospital Projected CT Scan Volume

	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028
Total Projected Scans	15,665	16,448	17,270	18,134	19,041	19,993

In addition to the projected growth in scan volume due to a growing and aging population, low-dose CT ("LDCT") lung cancer screenings also have the potential to increase demand for CT. BNH offers LDCT lung cancer screenings of high-risk patients, which can significantly decrease lung cancer mortality. Table 8 highlights the historical volume of LDCT screenings.

Table 8: Baystate Noble Hospital Historical Lung Cancer Screening Volume

	CY2019	CY2020	CY2021	CY2022 Annualized
Annual Screenings Completed	104	252	386	428

In 2022, Centers for Medicare & Medicaid Services (CMS) expanded eligibility for these screenings by lowering the starting age for lung cancer screening and reducing requirements around tobacco smoking history, which will increase access to lung cancer screening for at-risk populations. The Applicant notes there is potential for a greater volume of LDCT screenings due to a large unscreened pool of patients who qualify for lung cancer screening. LDCT has been underutilized with only 12.5% of the eligible population receiving this screening exam.^d

Analysis

Staff finds that the historic and projected growth in CT scan volume demonstrate sufficient need for a second CT unit at BNH. By reducing over-utilization of the current unit, BNH will be able to extend its useful life, delaying the need for replacement and significant disruption for patients. Acquiring a second CT unit will also decrease the amount of downtime on the existing unit, in turn prolonging the life of both units. In addition, the second unit will ensure redundancy if either unit requires repair or maintenance. A second unit will provide capacity to accommodate emergent patients without disrupting access to CT for inpatients and outpatients. As a hospital designated as a Primary Stroke Service, a second CT unit will provide the timely access to a CT scan, which is essential to the swift

¹⁰ Billing Code Emergency Service Class 4 indicates a severe problem that requires urgent evaluation but does not pose a threat to physical function, but that without treatment there is a high chance of extreme impairment.

¹¹ The CPA Report notes the methodology the Applicant used for these projections assumed a 5% increase per fiscal year, which represents the expected growth of BNH's patient panel, plus the additional volume BNH can absorb if lead time is alleviated with the addition of a second CT scanner.

diagnosis and treatment of patients showing signs of a stroke. Having the capacity to perform necessary CT scans will also eliminate the costs associated with transferring patients to Baystate Medical Center. The Proposed Project will also accommodate additional demand for outpatient CT services and allow improved access for LDCT lung screenings in adherence with recommended timelines. As a result, Staff finds that the Proposed Project meets the requirements of Factor 1a.

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

In this section staff will assess if the Proposed Project adds measurable public health value in terms of improved health outcomes and quality of life for the Applicant's existing Patient Panel, while providing reasonable assurances of health equity.

Public Health Value and Health Outcomes

The Applicant asserts that the Proposed Project aims to improve health outcomes and quality of life through the provision of timely CT imaging, which will lead to earlier diagnosis and treatment, thereby improving quality of life. To demonstrate improved public health value and quality of life, the Applicant provided well documented clinical utility of CT technology overall, and why it is the preferred imaging modality for a number of clinical concerns.

A Computed Tomography (CT) is an imaging tool that utilizes x-ray beams to generate cross-sectional images - or "slices" - of the bones, blood vessels and soft tissue.^e As a result, CT scans produce more clear, detailed images than conventional x-rays, making CTs extremely useful in detecting tumors or lesions within the abdomen and lungs; detecting heart disease or abnormalities of the heart; head injuries; and blood clots and embolisms.^f CT scans can generally be performed in minutes, which means providers can quickly detect and diagnose emergent conditions such as strokes and consequently, reduce the chances of brain damage and disability.^g

With BNH serving as a Primary Stroke Service, the Hospital must have adequate CT capacity to serve stroke patients within the recommended timeframe.¹² The addition of a second CT unit at BNH will provide redundancy to allow all patients prompt access to CT imaging. This will enable BNH to have the CT capacity to expand its Lung Cancer screening program, which the Applicant predicts will increase screening rates and early identification of lung cancer. Early identification can lead to treatment when disease can be more easily treated at lower costs than advanced disease, ultimately improving health outcomes.

Analysis: Public Health Value, Health Outcomes, and Quality of Life

Staff finds that timely access to CT imaging contributes to improved health outcomes for all patients. Not having adequate access to CT scans can lead to delays in diagnosis and treatment. Unimpeded access to a CT scan is a particular concern for BNH as a designated Primary Stroke Service, which requires expedient patient imaging for proper diagnosis and treatment of patients. DoN Staff finds that a second CT unit will allow a greater capacity for CT imaging and potential for greater emphasis on

¹² According to the Massachusetts Department of Health's Time Target Recommendations and the American Heart Association/American Stroke Association's "Get With the Guidelines – Stroke", CT imaging should be completed within 25 minutes of arrival to the hospital, and IV thrombolytic ("tPA") treatment should begin within one hour of patient arrival.

prevention and early treatment through its Lung Cancer Screenings. Staff finds that the Proposed Project has potential to add to public health value in terms of improved health outcomes and quality of life for the Applicant's Patient Panel. As a result, Staff finds that the Applicant meets the requirements of the Public Health Value: Health Outcomes part of Factor 1b.

Health Equity and Social Determinants of Health (SDoH)

The Applicant states that, "Baystate Health's mission is to improve the health of the people in its communities every day with quality and compassion. Confronting racism and bias behaviors is critical to achieving this mission." The Applicant states that they have been focusing on this mission since 2008, when the Applicant launched its diversity, equity, and inclusion initiative. The Applicant states that the three areas of focus for health equity are 1) reducing health disparities, 2) growing a more diverse work force, and 3) ensuring language accessibility.

- 1) Reducing Health Disparities:** The Applicant noted its efforts to reduce health disparities by closely examining quality, safety, and patient experience through an equity lens and making necessary changes in protocols and practices. Baystate Health's Accountable Care Organization (ACO), called BeHealthy Partnership, collects, and uses data containing patient race and ethnicity data for each of the programs to ensure its programs are equitable. The Applicant notes that they review health equity data regularly and address any disparities discovered. The Applicant also notes that Baystate Health signed the American Hospital Association's #123forEquity pledge campaign to eliminate health disparities. The pledge asks hospital and health system leaders to begin taking action to accelerate progress on the following areas:
 - Increasing the collection and use of race, ethnicity, language preference and other socio-demographic data
 - Increasing cultural competency training
 - Increasing diversity in leadership and governance
 - Improve and strengthen community partnerships
- 2) Growing a More Diverse Workforce:** The Applicant states that a diverse workforce provides representation and leads to innovative thinking. The Applicant noted its commitment to equity in the hiring, promotion, and retention of Black and Brown employees. Baystate Health cited internal hiring demographic data showing that they have achieved a 14.7% increase in Underrepresented in Medicine (URiM) leaders, a 22.5% increase in URiM providers and a 19.5% increase in URiM Direct Care Registered Nurses. In addition to diverse hiring and staff retention, the Applicant stated that they have added "Equity and Belonging" as a new core competency for all staff, which has been added to Baystate Health's Core Values of Respect, Integrity, Teamwork and Lifelong Learning. As part of this effort, the BeHealthy Partnership hosted two trainings for leadership, providers, and clinical staff in 2019. A two-day "Healing Racism" session was offered by the Healing Racism Institute of Pioneer Valley. Also, Baystate Health offered "Cultural Humility" trainings for staff. The Applicant noted that they plan to continue training for additional staff and to provide a deeper experience for those who have already participated.
- 3) Ensuring Language Accessibility:** BNH provides qualified interpreters to patients and families who speak languages other than English. This service is available to all patients and families at

BNH 24 hours a day, 7 days per week at no charge. Over 200 languages are quickly accessible as needed by in-person, video, and telephonic interpreting. The interpreters assist patients and their families with understanding procedures, medications and any other circumstance that would necessitate exchange of information.

Analysis: Health Equity and SDoH

The DoN Staff reviewed the Applicant's efforts to ensure equitable care. The Applicant demonstrates a long-standing focus on health equity and was able to provide examples of using data, staff development and language access to continue their efforts toward health equity goals. Staff finds that the Applicant has sufficiently outlined ongoing efforts to achieve health equity. As a result, Staff finds that the Applicant meets the requirements of the Public Health Value: Health Equity part of Factor 1b.

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

The Applicant states that the Proposed Project promotes continuity and coordination of care for its patients through timely access to CT imaging and utilization of technology infrastructure.

Timely Access to CT Imaging: As noted in previous sections, the Proposed Project allows capacity expansion for the BNH Patient Panel. BNH currently has only one CT unit and cannot perform CT-guided procedures without impeding access to CT imaging for urgent stroke and emergency department patients. In addition, downtime to perform CT maintenance leaves BNH without CT capability and patients may be rescheduled or transported by ambulance to Baystate Medical Center, further delaying timely treatment. The addition of a second CT unit will provide the BNH's Patient Panel with uninterrupted and increased local access to CT imaging and CT-guided procedures.

Technology Infrastructure: The technology infrastructure for the Proposed Project streamlines access for patients and facilitates improved coordination of care among physicians and other professionals on a patient's Baystate Health care team. BNH's electronic medical record (EMR) serves as the primary linkage within the Hospital and between community primary care and other providers. With respect to the Proposed Project, the EMR provides BNH radiologists 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 CT study. Once the radiologist's report is complete, the EMR enables CT imaging results and information to be available to primary care and specialty physicians across the system and integrated into the patient's EMR. The EMR also allows authorized providers outside of BNH to view patients' records and send progress notes back for continuity of care.

Analysis

Staff finds that timely access to CT imaging and use of technology infrastructure will contribute positively to efficiency, continuity, and coordination of care. The Applicant sufficiently demonstrates the need for a second CT unit to expand the Hospital's capacity to serve both urgent and routine CT imaging needs without interruption. Review of the literature points to evidence which suggests access to integrated health information technology systems directly impacts health outcomes through reducing fragmentation and improving coordination among care providers.^h Similarly, other studies

show that integrated health information technology systems directly affect health outcomes, as access to a single, integrated health record, can reduce errors, improve patient safety, and support better patient outcomes.¹ BNH's EMR supports communication between the patient, physician, and all care team members that can foster better collaboration. As a result, Staff finds that the Proposed Project meets the requirements of Factor 1c.

Factor 1: d) Consultation

The Applicant has provided evidence of consultation, both prior to and after the Filing Date, with the following government agencies that have licensure, certification, or other regulatory oversight:

- Director, Determination of Need Program, Department of Public Health
- Office of Community Health Planning and Engagement, Department of Public Health
- Massachusetts Executive Office of Health and Human Services
- Health Policy Commission
- Center for Health Information and Analysis
- The Centers for Medicare & Medicaid Services

As a result, Staff finds that the Proposed Project meets the requirements of Factor 1d.

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

The Department's Guideline¹³ 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."¹⁴

The Applicant presented the Proposed Project presented to the following groups:

- The Hospital's Community Benefits Advisory Council (CBAC)
- The Hospital's Patient Family Advisory Council (PFAC)
- The Community Advisory Council (CAC)
- Virtual Community Meeting

The presentations reviewed the purpose of the Proposed Project, what it would mean for patients and the community, and provided a general overview of the Proposed Project's process.

- 1) **The Hospital's Community Benefits Advisory Council (CBAC):** The Proposed Project was presented a BNH's CBAC in October 2021 with 10 community attendees and 8 hospital participants. Membership includes individuals representing hospital departments (Emergency Department, Translation Services) and community stakeholders (City of Westfield, Senior Center, Youth Services, Westfield State University, and other social service agencies). The

¹³ [Community Engagement Standards for Community Health Planning Guideline.](#)

¹⁴ [DoN Regulation 100.210 \(A\)\(1\)\(e\).](#)

presentation offered members an overview of the Proposed Project and how it will benefit current and future patients. The discussion focused on the CHI process.

- 2) **The Hospital's Patient Family Advisory Council (PFAC):** The Proposed Project was presented to the BNH's PFAC in October 2021 with 4 patients and 8 hospital participants in attendance. The PFAC is a group of family members and health care professionals who meet regularly to focus on continuous improvement of care experiences, and work in partnership to integrate patient/family voices in the development programs, services, and initiatives. Like the CBAC presentation, the presentation sought to inform the BNH PFAC members about the purpose of the Proposed Project and the effect on its patients. There were no questions asked or feedback provided on the presentation.
- 3) **The Community Advisory Council (CAC):** The Proposed Project was presented to the BNH's CAC in November 2021 with 5 community members and 2 hospital participants in attendance. Membership includes between seven to fifteen members, including the Hospital President/Chief Administrative Officer and at least one elected trustee of the Baystate Health Board. The majority of members are external, local community members including community leaders. Discussion centered on CHI funding, the DoN Application, financial projections for the additional scanner, the current wait times for a CT scan, and the proposed location for the new CT scanner.
- 4) **Virtual Community Meeting:** The Proposed Project was presented to a Virtual Community Meeting in November 2022 with 4 community members and 10 hospital staff in attendance. The Virtual event that was promoted and open to the general public. No questions were asked, nor feedback provided.

Analysis

Staff reviewed the information on the Applicant's community engagement and finds that the Applicant has met the required community engagement standard of Consult in the planning phase of the Proposed Project. As a result, Staff finds that the Proposed Project meets the requirements of Factor 1e.

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 will compete on the basis of price, total medical expenses (TME), provider costs, and other recognized measures of health care spending by ensuring timely access to CT services. The Applicant expects that with a second CT unit, the Hospital will always be able to provide access to CT, eliminating ambulance transport costs that occur when a patient is sent to another facility during BNH's CT downtime. The new CT unit will be reimbursed at the same rate as the existing scanner and will not impact costs for payers or patients.

The Applicant notes that BNH has an appropriate use criteria program (AUC) using the clinical decision support mechanism (CDSM). The CDSM is an interactive, electronic tool that evaluates AUC information to assist with making the most appropriate advanced diagnostic imaging service order based on the patient's clinical condition. The goal is to order and provide the advanced diagnostic imaging service most likely to improve the health outcome of the patient. CMS implemented this tool to ensure the most appropriate tests are ordered for Medicare patients, and to decrease the number of inappropriate and unnecessary orders for advanced diagnostic imaging.

Analysis

The Proposed Project has the potential to reduce costs by providing CT imaging services on site at BNH, saving the expense of transporting to Baystate Medical Center to complete imaging services. While advanced imaging improves clinical care, it is also the source of overuse and added healthcare costs.^j Staff notes that the Applicant has procedures to ensure appropriate use of CT imaging and minimize overuse. The Applicant plans to review providers' use of the American College of Radiology Clinical Decision Support Tool for adult PET-CT orders to avoid any unnecessary imaging. Staff finds that, on balance, the requirement that the Proposed Project will likely compete on the basis of price, TME provider costs, and other measures of health care spending have been met.

Summary, FACTOR 1

As a result of the information provided by the Applicant and additional analysis, staff finds that the Applicant has demonstrated that the Proposed Project meets Factor 1.

Factor 2: Cost containment, Improved Public Health Outcomes and Delivery System Transformation

For Factor 2 the Applicant must demonstrate that the Proposed Project will meaningfully contribute to the Commonwealth's goals for cost containment, improved public health outcomes, and delivery system transformation beyond the Patient Panel.

Cost Containment

The Applicant asserts that the Proposed Project will contribute to the Commonwealth's goals for cost containment by reducing costs through increased efficiencies in operations. The Applicant anticipates that timely access to CT imaging services will reduce wait-times for CT, potentially saving costs through the gained efficiencies of earlier diagnosis and treatment. The Applicant states that the Proposed Project ensures that the Patient Panel has prompt and equitable access to CT imaging services at the lowest reasonable aggregate cost. The Applicant asserts that there will be no change in BNH's contracted rates for CT services and will have no impact on costs while ensuring timely access to care.

Analysis: Cost Containment

Staff finds that the Applicant has adequately explained how it aligns with cost containment goals through the expansion of low-cost imaging services provided on site at BNH. Therefore, DoN Staff can conclude that the Proposed Project will likely meet the cost containment component of Factor 2.

Improved Public Health Outcomes

The Applicant anticipates the Proposed Project will improve public health outcomes by ensuring timely emergency access to CT imaging. Early intervention CT imaging is essential for trauma, stroke, cardiac and other emergency patients. A second CT unit will provide BNH with adequate capacity to provide CT imaging for both emergency and non-emergency circumstances. The Applicant predicts that the Patient Panel will achieve better health outcomes by eliminating the delay in diagnosis and intervention for those requiring CT. The second unit will also allow an expansion of the preventative LDCT services, which has the potential to improve Patient Panel outcomes through early detection of lung cancer.

Analysis: Public Health Outcomes

Staff finds that the Proposed Project will provide the Patient Population more timely access to imaging services that has the potential to improve health outcomes. Timely access can reduce delays in diagnosis and treatment that can adversely impact health outcomes. With ample access to CT services, BNH will be able to simultaneously provide emergency CT scans as well as routine diagnostic and preventative scans. Therefore, DoN Staff can conclude that the Proposed Project will likely meet the Public Health Outcomes component of Factor 2.

Delivery System Transformation

Baystate Health has a system in place for screening social determinants of health for the Patient Panel. The Applicant notes that patients are referred to community services as identified through the Health Related Social Needs Screening tool as well as the MassHealth ACO Flexible Services program criteria. Screening tools are also available in the Baystate Health Center's EMR with a target for annual re-screening. Referrals and connections to social services are a routine activity performed by BNH Care Teams. When a need is identified, the patient may be referred to a community health worker (CHW) for assistance or may be given information directly from the primary care team. In most circumstances, a CHW will continue to work with a patient to ensure that connections with community services are made.

Analysis: Delivery System Transformation

Central to the goal of Delivery System Transformation is the integration of social services and community-based expertise. The Applicant screens patients on relevant SDoH factors and demonstrates a variety of methods for linking patients to needed community resources. Staff notes that BNH has embedded screenings and referrals into their patient care procedures, ensuring that necessary connections occur. Therefore, DoN Staff can conclude that the Proposed Project will likely meet the Delivery System Transformation component of Factor 2.

Summary, FACTOR 2

As a result of information provided, staff finds that the Proposed Project has sufficiently met the requirements of Factor 2.

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 this Factor will not be addressed further in this report. As a result of information provided by the Applicant, staff finds the Applicant has reasonably met the standards of Factor 3.

Factor 4: Financial Feasibility

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.

The CPA report is an analysis of the Applicant's five-year projections for the years ending September 30, 2024, through September 30, 2028 (the "Projections"), an analysis of existing results of the current CT scanner for FY2019 through FY2022, projections for the FY2023, and the related supporting documentation. The CPA assessed the reasonableness¹⁵ of assumptions used in the preparation and feasibility¹⁶ of the projections with regards to the Proposed Project.

Revenues

The CPA Report analyzed the net operating revenues in the historical and projected financial information based on "clean"¹⁷ outpatient scans. The CPA analyzed the projected/pro-forma revenue for FY2024 through FY2028 using historical results of one existing CT scanner at BNH for FY2019 through May 31, 2022, and the projected results of the one existing CT scanner for fiscal years 2022 and 2023. The CPA stated that the revenue projected by Management is a reasonable estimation and conservative based primarily upon historical volume of operations. The CPA also stated that the pro-forma operating revenues were reasonable.

Expenses

The CPA Report analyzed each of the categorized operating expenses for reasonableness and feasibility related to the projections. The operating expenses in the analysis include salary and wages, fringe benefits, patient supplies, contrast and drugs, depreciation for the current and proposed CT scanners, purchased services, and subscription/licensing fees. Salaries and wages in fiscal year 2024 include the addition of 2.2 full-time equivalents (FTE) to operate the second CT scanner. In addition, for FY2022 and forward, the Applicant assumes a 3% wage increase for inflation. Based on the CPA's analysis of the projected/pro-forma expenses for FY 2024 through FY2028, the CPA finds that the pro-forma total expenses are reasonable. The CPA also found that the capital needs and ongoing operating costs required to support the addition of a second CT scanner are not likely to result in a scenario where there is negative cash flow.

¹⁵ Reasonableness is defined within the context of this report as supportable and proper, given the underlying information.

¹⁶ Feasibility is defined as based on the assumptions used, the plan is not likely to result in insufficient funds available for capital and ongoing operating costs necessary to support the proposed project without negative impacts or consequences to Baystate or BNH's existing Patient Panel.

¹⁷ "Clean" meaning no other services were performed other than a CT scan.

Capital Expenditures

The CPA Report reviewed the capital expenditures projected related to the Proposed Project. The projected capital costs are \$1,218,286. The projected capital costs consist of approximately \$853,000 for the CT procurement, \$218,000 for constructions costs, and \$147,000 for design fees.

The CPA concluded, “We determined that the projections reviewed were not likely to result in insufficient funds available for ongoing operating costs necessary to support the Proposed Project. Based upon our review of the projections and relevant supporting documentation, we determined the Project and its projected operating revenue, expenses and cash flow are reasonable and based upon feasible financial assumptions. Therefore, the addition of a second CT scanner at BNH and the capital needs associated with this service is financially feasible and within the financial capability of Baystate.”

Analysis

Staff is satisfied with the CPA’s analysis of Applicant’s 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

Evaluation of 105 CMR 100.210(A)(5) shall take into account, at a minimum, the quality, efficiency, and capital and operating costs of the Proposed Project relative to potential alternatives or substitutes, including alternative evidence-based strategies and public health interventions.

The Applicant considered and rejected one alternative to the Proposed Project.

Alternative Option: Do not acquire a second CT unit and continue to serve patients with a single CT unit. This alternative was rejected because it does not address the need of BNH’s Patient Population to have timely access to CT imaging, both currently and as demand increases in the future. This option carries no capital expenses or additional operating costs. However, BNH and Baystate Health resources will continue to be strained under this alternative, which will result in delays in diagnosis and treatment, and could adversely impact patient outcomes and quality of life.

Analysis

Staff finds that the Applicant has appropriately considered the quality, efficiency, and capital and operating costs of the Proposed Project relative to the potential alternative. As a result of information provided by the Applicant, staff finds the Applicant has reasonably met the standards of Factor 5.

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

Summary and relevant background and context for this application: This is a DoN project for equipment to be located at a hospital and will result in a Tier 1 Community-based Health Initiative (CHI). For DoN-regulated equipment, standard practice is to contribute the 10% of the CHI contribution to the statewide fund and 90% of the CHI contribution to local health priorities. In this case the Applicant, Baystate Health, has an existing CHI project (Project #: BNEOS-

21122916-AS) in the covered geography and will pool these local CHI funds with that existing investment to benefit Baystate Noble Hospital's community.

Subject to DoN approval, the Applicant and DPH have agreed to combine CHI funds for a transparent local CHI investment process. In anticipation of this agreement, for this project, to fulfill Factor 6 requirements, the Applicant submitted its recent 2022 Community Health Needs Assessment (CHNA) Self-Assessment, 2020-2022 Strategic Implementation Plan, and a CHI Narrative. The Applicant plans to use the 2022 CHNA findings to inform the investment strategies for the CHI funds associated with this application. Stakeholder Assessments and a Community Engagement Plan were not required in this case as this application is associated with documents from a recently approved July 2022 application (Project #: BNEOS-21122916-AS). In sum, the Applicant has submitted these subsequent documents as part of a project covered by the same timeframe for the 2022 CHNA.

The 2022 Community Health Needs Assessment was conducted by the applicant, Baystate Health, in partnership with the Coalition of Western Massachusetts Hospitals/Insurers (Coalition), a coalition formed in 2012 that currently consists of 9 non-profit hospitals, clinics, and insurers in the region to coordinate resource and activities for conducting their CHNA. A consultant team led by the Public Health Institute of Western Massachusetts (PHIWM) collaborated with the Coalition to conduct the CHNA. Additionally, a Regional Advisory Council (RAC) was assembled and met monthly for a year and a half to provide guidance and to make decisions that informed the assessment process and the prioritization of health needs. The Coalition and RAC worked closely to guide the CHNA process with values of community-led change, anti-racism, cultural humility, and social justice.

In completing the 2022 CHNA, the Applicant updated the prioritized community health needs identified in the 2016 and 2019 CHNA reports as they relate to social influencers of health, healthcare access barriers and health behaviors and outcomes. The 2022 CHNA process consisted of reviewing existing reports; surveying public health officials, preliminary analysis of COVID-19's impact on the region; and analysis of quantitative data with efforts where possible to disaggregate (e.g., by race, ethnicity, age, LGBTQIA+ identity, or geography) to increase understanding of health inequities. The Applicant conducted focus groups, key informant interviews, several Community Chats throughout the communities served by Baystate Noble. The interviews and focus groups focused primarily on youth mental health.

The CHNA for 2022 lists the following as the key priorities identified – Social and Economic Factors that Influence Health—Access to Basic Needs, Barriers to Health Care Access—Availability of Providers, Health Behaviors and Outcomes—Youth Mental Health, Mental Health and Substance Use, Environment. Additional prioritized health needs identified in the 2022 CHNA include inequities in social and economic factors that affect health, resulting in the prioritization of employment and income, violence and trauma, environmental exposures and climate change, chronic health conditions such as Alzheimer's disease and asthma, and more. In assessing Baystate Health's 2022 CHNA, CHI staff determined that it is an adequate and appropriate basis for CHI purposes.

The CHI Narrative provided background and overview information for the CHI processes. The narrative also outlines roles and duties for the advisory and allocation committees, and planned use of funding

for evaluation and administrative activities. Additionally, the narrative outlines the CHI funds breakdown and the anticipated timeline for pooled CHI-funded activities.

The timeline, RFP processes, and use of evaluation and administrative funds are all appropriate and in line with CHI planning guidelines. The Applicant has a strong infrastructure for existing and future community health improvement planning activities. As part of its planning for previous CHI processes, Baystate Health established a practice for equitable and transparent distribution of CHI funds. There are 4 hospitals within the Baystate system, and the practice is to distribute funds equitably across them, utilizing key criteria. These funds will support existing community health planning for Baystate Noble Hospital region, the site that shares geography with the proposed project. The Applicant's current work focuses on priority areas that allow for implementation at the root cause level. The Applicant will work with its Community-Based Advisory Committee (CBAC) to select priorities and approve implementation strategies.

Based on strategies in the Applicant's ongoing community benefit work, DPH staff have determined that as the Applicant agrees to ongoing local CHI work related to this project and continued engagement with their CBAC, CHI investment will align appropriately with the Health Priorities Guideline. The Applicant will also provide status updates throughout the CHI implementation process.

The anticipated timeline for CHI activities includes a meeting of the Advisory Committee six weeks post approval, identifying the Health Priorities Strategies 3-4 months post approval, and deciding on best investment strategy to support existing efforts five to six months post approval, with funding disbursed 10-12 months thereafter.

With the administrative funds, the applicant's preliminary plans are to develop and disseminate communication materials to encourage community participation in the process.

Analysis

As a result of information provided by the Applicant and additional analysis, staff finds that with the conditions outlined below, and with their commitment to conduct ongoing Community Health Planning processes in the geography of the Baystate Noble, the Applicant has demonstrated that the Proposed Project has met Factor 6.

Findings and Recommendations

Based upon a review of the materials submitted, Staff finds that, with the addition of the recommended conditions detailed below, the Applicant has met each DoN Factor for the Proposed Project and recommends that the Commissioner approve this Determination of Need, subject to all applicable Standard and Other Conditions.

Other Conditions

CHI Contribution

1. Of the total required CHI contribution of \$60,914.30
 - a. \$5,847.77 will be directed to the CHI Statewide Initiative
 - b. \$52,629.96 will be dedicated to local approaches to the DoN Health Priorities
 - c. \$2,436.57 will be designated as the Administrative Allowance
2. To comply with the Holder's obligation to contribute to the Statewide CHI Initiative, the Holder must submit a check for \$5,847.77 to Health Resources in Action (the fiscal agent for the CHI Statewide Initiative).
 - i. The Holder must submit the funds to HRiA within 30 days from the date of the Notice of Approval.
 - ii. The Holder must promptly notify DPH (CHI contact staff) when the payment has been made.

Payment should be sent to:
Health Resources in Action, Inc., (HRiA)
2 Boylston Street, 4th Floor
Boston, MA 02116
Attn: Ms. Bora Toro

Appendix I: Measures for Annual Reporting

Outcome Measures

To assess the impact of the Proposed Project, the Applicant has developed the following outcome measures. The Applicant will report this information to the Department's DoN Program staff as part of its annual report required by 105 CMR 100.310(A)(12) following implementation of the Proposed Project. For all measures, the Applicant will provide to the program a baseline upon implementation of each project component, along with updated projections, which the program will use for comparison with the annual data submitted. Reporting will include a description of numerators and denominators.

- 1) **Access – Lung Cancer Screening:** Increased access to screening services is likely to increase the number of patients who received lung cancer screening as recommended. Baystate Noble will be able to offer additional lung cancer screening appointments upon implementation of the Proposed Project.
 - a. *Measure:* The number of low-dose CT scans provided at Baystate Noble annually.
 - i. *Baseline:* 386 scans
 - ii. *Projections:* Year 1: 398; Year 2: 410; Year 3: 422
- 2) **Time Between Order Entry to Complete CT in the ER:** The order to complete time for CT in the ER is likely to be improved.
 - a. *Measure:* The number of ED CT scans completed in 1 hour from order entry time divided by number of total ED CT scans completed. This metric will be monitored monthly on Radiology Dashboard,

- i. *Baseline*: 53% of CT orders from the ER completed within 1 hour
- ii. *Projections*: Year 1: 67%; Year 2: 70%

REFERENCES

- ^a See *Primary Stroke Services Time Target Recommendations (6/2009)*, <https://www.mass.gov/doc/pss-time-target-recommendations-0/download> ; Get With the Guidelines – Stroke Fact Sheet. https://www.heart.org/-/media/Files/Professional/Quality-Improvement/Get-With-the-Guidelines/Get-With-The-Guidelines-Stroke/Stroke-Fact-Sheet -FINAL UCM_501842.pdf.
- ^b UMass Donahue Institute MassDOT Vintage 2018 Population Projections, *Massachusetts Population Projections*, September 2018, <http://www.pep.donahue-institute.org>.
- ^c *Id.*
- ^d See Thomas B. Richards, M.D., Ashwini Soman, MBBS, et al., Screening for Lung Cancer – 10 States, 2017, Centers for Disease Control and Prevention, MMWR Morb Mortal Wkly Rep 2020;69:201 -206, https://www.cdc.gov/mmwr/volumes/69/wr/mm6908a1.htm?s_cid=mm6908a1_w.
- ^e See U.S. Department of Health & Human, <https://www.nibib.nih.gov/science-education/science-topics/computed-tomography-ct> (last visited Feb. 24, 2022); Mayo Clinic, <https://www.mayoclinic.org/tests-procedures/ct-scan/about/pac-20393675> (last visited Feb. 24, 2022).
- ^f See *How Does a CT or CAT scan work?*, MedicalNewsToday, <https://www.medicalnewstoday.com/articles/153201#procedure> (last modified June 23, 2017).
- ^g See *How CT scans and MRIs are Used to Diagnose Strokes*, <https://www.envrad.com/how-ct-scans-mris-used-to-diagnose-strokes/> (last visited Feb. 24, 2022).
- ^h HealthIT.gov. Improve Care Coordination. Available: <https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/improve-care-coordination>. Alain Pinsonneault, Shamel Addas, Christina Qian, Vijay Dakshinamoorthy & Robyn Tamblyn (2017) Integrated Health Information Technology and the Quality of Patient Care: A Natural Experiment, *Journal of Management Information Systems*, 34:2, 457-486, DOI: 10.1080/07421222.2017.1334477 Available: <https://www.tandfonline.com/doi/abs/10.1080/07421222.2017.1334477>
- ⁱ HealthIT.gov, <https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/improved-diagnostics-patient-outcomes>.
- ^j Hendee WR, Becker GJ, Borgstede JP, Bosma J, Casarella WJ, Erickson BA, Maynard CD, Thrall JH, Wallner PE. Addressing overutilization in medical imaging. *Radiology*. 2010 Oct;257(1):240-5. doi: 10.1148/radiol.10100063. Epub 2010 Aug 24. PMID: 20736333.imaging