

STAFF MEMORANDUM TO THE COMMISSIONER FOR DETERMINATION OF NEED	
Applicant Name	Mass General Brigham Incorporated
Applicant Address	800 Boylston Street, Suite 1150 Boston, MA 02199
Filing Date	July 14, 2023
Type of DoN Application	Substantial Change in Service – DoN-Required Equipment
Total Value	\$2,516,623.00
Project Number	MGB-23012310-RE
Ten Taxpayer Group	None
Community Health Initiative	\$125,831.25
Staff Recommendation	Approval
Type of Review	Delegated
<p style="text-align: center;"><u>Project Summary and Regulatory Review</u></p> <p>Mass General Brigham Incorporated (“MGB” or “Applicant”) submitted an application for the addition of one fixed Computed Tomography Unit (“CT”) and associated renovations in the Emergency Department of Cooley Dickinson Hospital (“Hospital” or “CDH”) located at 30 Locust Street, Northampton, Massachusetts 01060. The capital expenditure for the Proposed Project is \$2,516,623.00; the Community Health Initiatives (“CHI”) contribution is \$125,831.25.</p> <p>This DoN application falls within the definition of Substantial Change in Service, which are 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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## Overview

### Background

The Applicant, MGB, is a Massachusetts not-for-profit corporation, located at 800 Boylston Street, Suite 1150, Boston, Massachusetts, 02199. Table 1 shows acute and non-acute care facilities in Massachusetts that comprise the MGB system.<sup>1</sup>

**Table 1: The Hospitals that Comprise the Mass General Brigham, Inc. System**

<b>Acute Hospital</b>	<b>Type (Per CHIA Category<sup>a</sup>)</b>
1. Brigham and Women's Hospital	Academic Medical Center (AMC)
2. Massachusetts General Hospital	Academic Medical Center
3. Massachusetts Eye and Ear Infirmary	Specialty Hospital
4. Brigham and Women's Faulkner Hospital	Community Hospital
5. Newton-Wellesley Hospital	Community Hospital
6. Cooley Dickinson Hospital	Community High Public Payer Hospital
7. Martha's Vineyard Hospital	Community Hospital
8. Nantucket Cottage Hospital	Community Hospital
9. North Shore Medical Center	Community High Public Payer Hospital
<b>Non-Acute Hospital</b>	
1. McLean Hospital	Psychiatric Hospital
2. Spaulding Rehabilitation Hospital	Rehabilitation Hospital

The Applicant also operates a home health agency, Mass General Brigham Home Care, and its physician network comprises approximately 7,500 employed and affiliated primary care and specialty care physicians.

It also operates a non-profit managed care organization that provide health insurance and administrative services products to commercial populations, the MassHealth Program (Medicaid), and ConnectorCare. Mass General Brigham Inc. is a Health Policy Commission-certified ACO, inclusive of Mass General Brigham Accountable Care Organization, LLC.<sup>b, c</sup>

### Cooley Dickinson Hospital

CDH<sup>2</sup> is a Community High Public Paying Hospital that has 140 licensed beds and provides the following services/specialties: medical/surgical, intensive care, pediatrics, obstetrics, and

<sup>1</sup> Its hospitals are principal teaching affiliates of the medical and dental schools of Harvard University. And it operates a graduate level program for health sciences, and maintains the Mass General Research Institute, and the Brigham Research Institute (both are private, non-profit medical research enterprises). It also it operates a for-profit insurance company.

<sup>2</sup> Utilization of patient care services at the following MGB organizations was used to determine CDH's Patient Panel: Cooley Dickinson Hospital and Cooley Dickinson Physicians Organization.

psychiatric services. In addition to its main hospital campus in Northampton, CDH offers services to patients at hospital satellite locations throughout the Pioneer Valley in Western Massachusetts.

## Proposed Project

The Applicant is requesting to add one dedicated CT unit to be located in the Emergency Department (“ED”) at CDH. It currently has two CT units located in its Radiology Department (Radiology) which are shared with the ED, inpatient units, and scheduled out-patients. With the addition of the proposed unit, CDH will have CT imaging capacity to meet the needs of its Patient Panel and expand access to CT imaging for patients in service area.

## Patient Panel<sup>3</sup>

Table 2 below shows the Patient Panel for Fiscal Years<sup>4</sup> (“FY”) 2020 through FY22. During that timeframe, the number of patients utilizing MGB’s services increased 14.3%, and those using CDH’s services increased 14.6%.

**Table 2: MGB & CDH Patient Panel**

System/Hospital	FY20	FY21	FY22
MGB	1,567,944	1,725,378	1,792,288
CDH	94,912	106,054	108,778

Table 3 shows the demographic characteristics of both MGB and CDH. Staff notes the following:

- **Age**-The age 65 and over population comprises nearly one third of both MGB’s and CDH’s patients, with only slight fluctuations over the three-year reporting period.
- **Race/Ethnicity**- The MGB Panel reflects little change. While the Caucasian cohort is the only category that showed a slight decline from FY 20-23, decreasing from 75.5% to 73.8% there was no notable change in any other racial cohort. For CDH there were no notable changes in any racial cohorts. The Applicant notes that since patients were grouped into these categories based on how they self-identified, there is a portion of the patient population (~15.4% at MGB and ~17.7% at CDH) that either chose not to report their race or identified as a race that did not align with the standard categories.
- **Patient Origin**- the Applicant reports that the region contributing the largest number of patients to its Patient Panel is greater Boston (HSA 4) 42.1%, and the next largest number of patients originate from out of state, 16.5%. CDH’s patients come primarily

<sup>3</sup> As defined, in part, 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.

<sup>4</sup> The Applicant’s fiscal year is from October 1 – September 30. The fiscal year data was pulled as of January 3, 2023.

from Western MA (HSA 1) 91.8% where it is located, with the second largest cohort coming from out of state, 4.1%.

**Table 3: Demographic Profiles of MGB and CDH**

Patient Demographics	MGB		CDH	
	FY22 Count	FY22 %	FY22 Count	FY22 %
MGB Total	1,792,288	N/A	108,778	N/A
Gender - Female	1,030,477	57.5%	62,880	57.8%
Gender - Male	761,516	42.5%	45,795	42.1%
Gender -Other/Unknown	295	0.0%	103	0.1%
Age - 0-17	192,945	10.8%	11,125	10.2%
Age - 18-64	1,087,412	60.7%	65,977	60.7%
Age - 65+	511,899	28.6%	31,676	29.1%
Age - Unknown	32	0.0%	-	-
Race - American Indian or Alaska Native	3,503	0.2%	244	0.2%
Race - Asian	88,137	4.9%	2,848	2.6%
Race - Black or African American	99,490	5.6%	2,801	2.6%
Race - Hispanic/Latino	192	0.0%	0	0.0%
Race - Native Hawaiian or Other Pacific Islander	1,344	0.1%	51	0.0%
Race - Other/Unknown	276,741	15.4%	19,226	17.7%
Race - White	1,322,881	73.8%	83,608	76.9%
Patient Origin - HSA_1	111,279	6.2%	99,866	91.8%
Patient Origin - HSA_2	72,924	4.1%	1,184	1.1%
Patient Origin - HSA_3	105,250	5.9%	373	0.3%
Patient Origin - HSA_4	754,979	42.1%	1,770	1.6%
Patient Origin - HSA_5	214,108	11.9%	693	0.6%
Patient Origin - HSA_6	233,937	13.1%	398	0.4%
Patient Origin - In MA (not HSA 1-6)	38	0.0%	64	0.1%
Patient Origin - Outside of MA	295,425	16.5%	4,430	4.1%
Patient Origin - Unknown	4,348	0.2%	<sup>5</sup>	-

- **Payer Mix-** The Applicant averaged its payer mix over the three-year timeframe and noted the following:
  - Between FY20 and FY22, on average 37.61% of all MGB patients, and 15.6% of CDH patients were covered by Commercial PPO/Indemnity Plans;
  - On average 19.64% of MGB, and 17.7% of CDH patients were covered by Commercial HMO/POS;

<sup>5</sup> Included in Patient Origin - In MA but not in HSA 1-6 Cohort

- On average, approximately 22.1% of MGB, and 37.2% of CDH patients were covered by Medicare, while 6.6% and 11.9% of CDH patients, respectively, were covered by Commercial Medicare.
- 5.93% of MGB and 9.9% of CDH patients were covered by MassHealth, while 2.22% and 2.7% of patients, respectively, were covered by Managed Medicaid.
- For both MGB and CDH, just over 5.5% were covered by *Other*.
- Both MGB's and CDH's patients experienced insignificant shifts in coverage between FY20 and FY22.

Table 4 shows the Payer mix for FY22 for both MGB and CDH. Staff notes that CDH has a greater share of all Medicare 40.2% (as compared MGB's 29%- FY2022) and also a greater share of all Medicaid 12.3% (compared to MGB's 8.3%- FY22), with a similar difference (by MGB vs. CDH) for FY20 and 21.

**Table 4: FY 2022 Payer Mix for FY MGB and CDH**

<b>Payer Group</b>	<b>MGB</b>	<b>CDH</b>
	<b>FY22</b>	<b>FY22</b>
Commercial (PPO/Indemnity) <sup>6</sup>	37.5%	16.0%
Commercial (HMO/POS) <sup>7</sup>	19.2%	16.0%
Medicare <sup>8</sup>	21.6%	36.7%
Commercial Medicare	7.5%	13.5%
MassHealth	6.0%	9.4%
Managed Medicaid	2.3%	2.9%
Other <sup>9</sup>	6.0%	5.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>

### **Factor 1: a) Patient Panel Need**

The Applicant attributes Patient Panel need for the Proposed Project to the following:

- 1. Historical Growth in CT Scan Volume**
- 2. Need for Timely Access to CT for ED patients**
- 3. Need for Timely Access to CT for other in- and out-patients**
- 4. Need to account for Population Growth including among the Aging Population**

<sup>6</sup> Commercial plans without an identified product type were included in the PPO/Indemnity product category.

<sup>7</sup> Includes ConnectorCare plans.

<sup>8</sup> Includes Medicare supplements.

<sup>9</sup> Includes Free Care, TriCare, VA, Uninsured COVID-19 tests, Workers Compensation, International, and other uncategorized plans.

## 1. Historical Growth in CT Scan Volume

Staff requested utilization data for 2019 to better understand the pre-COVID-19 pandemic volumes and determine whether the Applicant had regained scan volume. Following a decline in FY 2020 (due to COVID-19), CT volume at CDH increased each year and surpassed 2019 volumes in 2021. From FY20 to 21 there was a ~23% increase in total scans; and from FY21 to 22 there was a ~16% increase in total scans. Staff annualized data for FY22 to 23 which suggests that growth would be ~ 28%. (See Table 5). This is greater than the Applicant's more conservative projections for 2023 of 23,994 scans; a 14% growth rate. (Discussed later, See Table 6.)

**Table 5: Historical CT Volume: FY 2019- FY 2023 Year to Date and Annualized**

CT Scan Volume	FY19	FY 19-20 % Change	FY20	FY 20-21 % Change	FY21	FY 21-22 % Change	FY22	YTD 10.22-6.23	FY 2023 Annualized
ED Scans	5,161	-3.0%	5,005	25.5%	6,279	30.4%	8,187	7,309	10,964
Scans Excluding ED	10,352	-7.4%	9,584	22.2%	11,712	8.6%	12,725	10,624	15,936
<b>Total</b>	<b>15,513</b>	<b>-6.0%</b>	<b>14,589</b>	<b>23.3%</b>	<b>17,991</b>	<b>16.2%</b>	<b>20,912</b>	<b>17,933</b>	<b>26,900</b>
ED Stroke CT (all)	NA	NA	213	34.7%	287	-0.7%	285	109	164
ED Ischemic Stroke (only)	NA	NA	136	14.7%	156	12.8%	176	66	99

Staff asked the Applicant to what it attributes the large overall growth (58.6% FY19-22) in scan volume. The Applicant responded that growth is largely attributable to significant ED visits growth (24%) from FY20-22. This led to growth of ~26%, and ~30% in ED CT scan volume from FY20-21 and FY21-22 respectively. It attributes CT growth to 1) Stroke protocol requirements, 2) an increase in spine CTs driven by an increase in orthopedic visits, and 3) growth abdominal CT scans due to primary care/urgent care access issues.

Staff notes that annualized data for FY23 suggests that growth may be ~ 34%: and that while ED scans comprise an average of 37.5% of total scans, ED scans comprise an increasing proportion of the total, and have grown from 33.3% in FY 19 to 40.8% of the total in FY23.

## 2. Need Timely Access to CT for ED Patients

CT is widely used to diagnose stroke. As a Primary Stroke Services Hospital<sup>10</sup>, the Emergency Medical Services system sends patients experiencing symptoms of a stroke to the CDH ED, where when clinically indicated, patients must be stabilized and transported to the radiology department (Radiology) for their CT. Clinical guidelines for stroke recommend that stroke patients receive CT imaging within 25 minutes of arrival at the ED. CDH is able to achieve the recommended 25-minute door to CT scan time 81.2% of the time (the Massachusetts average is 70.7%). Data provided by the Applicant indicate that consistently over 96% of all strokes including Ischemic Stroke patients receive CT scans. The volume of Ischemic Stroke scans at CDH has risen over the past two fiscal years (~15% and ~13%). Timely access to CT imaging is imperative to make a diagnosis and administer tissue plasminogen activator (“tPA”) to eligible patients. When administered quickly after stroke onset (within three hours, as approved by the FDA), tPA helps to restore blood flow to brain regions affected by a stroke, thereby limiting the risk of damage and functional impairment.<sup>11</sup>

Other ED patients requiring an emergent CT scan are also prioritized over less urgent cases. Staff inquired about the average wait times for all ED patients requiring CTs. The Applicant provided data that the wait-times have declined from a high of 69 minutes in FY 2020 to 46 minutes in in 2023. The Applicant also noted that in calendar year 2022, 22 patients were transferred out of CDH’s ED to other facilities for CT interventional radiology care (described below).

### **3. Need Timely Access to CT for other patients**

The Applicant reports that the average wait time for a scheduled CT *from time ordered to CT scan* is 14 days for outpatient imaging.<sup>12</sup> The Applicant also reports that with two CT units, scheduled outpatient CT scans are often delayed since ED patients are prioritized, and that as ED CT volume increases, the impact of delays for scheduled CT patients will increase. Following staff inquiry, the Applicant states that when such delays occur, scheduled patients are accommodated on the same day unless the patient requests it be rescheduled. The Applicant asserts that with the proposed unit located in the ED, outpatients will have full access to the existing two units, thereby reducing wait times and delays they currently experience.

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<sup>10</sup> To be designated 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*, Mass. Dep’t of Pub. Health, <https://www.mass.gov/info-details/primary-stroke-service-pss-validation> (last visited Feb. 24, 2022). See also, *Designated Primary Stroke Services Hospitals*, Mass. Dep’t of Pub. Health, <https://www.mass.gov/info-details/designated-primary-stroke-services-hospitals> (last visited Feb. 24, 2022).

<sup>11</sup> National Institute of Neurological Disorders and Stroke <https://www.ninds.nih.gov/about-ninds/impact/ninds-contributions-approved-therapies/tissue-plasminogen-activator-acute-ischemic-stroke-alteplase-activaser#:~:text=When%20administered%20quickly%20after%20stroke,of%20damage%20and%20functional%20impairment>.

<sup>12</sup> This does not include patients who need 3-month, 6-month or annual CT exams that are schedule in advance.



CT also is used for CT-guided interventional radiology (“CT-IR”)<sup>13</sup> procedures and Coronary CT Angiography (“CCTA”)<sup>14</sup> which require a longer blocks of time, and once an interventional procedure begins, it cannot be interrupted.<sup>15</sup> CDH has limited interventional CT block times available for these procedures since emergent cases are prioritized, inpatients need access, and also the outpatient schedule is already full. The Applicant asserts that the addition of a third CT unit will allow the Hospital to increase the number of timeslots for interventional radiology and CCTA thereby improving access for patients needing such procedures.

A third CT unit will also enable CDH to expand its lung cancer screening program to respond to broadened screening guidelines. On February 10, 2022, the Centers for Medicare & Medicaid Services (“CMMS”) announced expanded eligibility coverage for low dose CT (“LDCT”) by lowering the starting age for screening from 55 to 50 years and by reducing the eligibility requirements apropos a patient’s history of tobacco smoking from *at least 30 packs per year* to *at least 20 pack per year*. The expanded eligibility is expected to drive increased CT volume.

#### **4. Population Growth including among the Aging Population**

From FY20 to FY22, the CDH’s *65 and older* age cohort grew by 3.29%. Notably, the number of patients 65 and older that received a CT scan increased by 36.5% (from 4,655 unique patients in FY20 to 6,358 unique patients in FY22). In FY21 and FY22, over half of patients receiving CT scans were age 65 and older: 51.53%, 51.95%, respectively.

The population of CDH’s primary service area is projected to increase by approximately 2.68% from 2020 to 2035.<sup>16</sup> In particular, the *65 and older* cohort, the age cohort that is most affected by conditions that CT is most beneficial for, is expected to grow by approximately 40.45% from 2020 to 2035.<sup>17</sup> As the Patient Panel ages, CDH patients will present with conditions that more frequently require advanced diagnostic imaging, including CT. Table 6 below details the Hospital’s CT volume projections following implementation of the Proposed Project.

Literature on patterns of CT use indicate that imaging rates tend to be higher among older adults.<sup>d</sup> According to a study published in 2013, average CT utilization rates were approximately 24, 72, 159, and 240 per 1,000 persons for ages <18, 18-44, 45-54 and 65+ years, respectively.<sup>e</sup> The high CT imaging rates among older adults are likely related to the higher incidences of age-related conditions including neurologic and stroke, arthritis and orthopedic, oncologic, and cardiac conditions. Staff notes that clinical applications since 2013 have expanded for this age cohort as discussed further under Factor 1(b).

#### **Projected Growth and Future Demand**

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<sup>13</sup> CT-IR is a way to diagnose and treat cancer and other conditions without major surgery

<sup>14</sup> CCTA is a non-invasive way to evaluate the blood vessels of the heart.

<sup>15</sup> As generally the patient needs preparations that may include being NPO, and an IV contrast agent administered.

<sup>16</sup> *Mass. Population Projections*, UMass.: Donahue Inst. (Sept. 2018), <http://www.pep.donahue-institute.org/>

<sup>17</sup> *Id.*

The Applicant asserts that based on historical volume and population growth, particularly in the aging sector, that CDH expects CT volume will continue to grow. After the first year, where overall growth is projected to be 18.5%, CT scan growth is projected to level off to ~1% annual growth through 2027.

**Table 6: Projected CT Volume FY 23-27**

CT Volume	FY23	% Increase	FY24	% Increase	FY25	% Increase	FY26	% Increase	FY27
Emergency Department	8,701	0.0%	8,701	1.0%	8,788	2.0%	8,963	2.0%	9,143
CT- IR	282	0.0%	282	4.0%	293	4.0%	305	4.0%	317
LDCT	561	6.0%	595	4.0%	619	4.0%	644	4.0%	670
Other <sup>18</sup>	14,450	30.5%	18,863	0.9%	19,037	0.4%	19,121	0.4%	19,200
Total	23,994	18.5%	28,441	1.0%	28,737	1.0%	29,033	1.0%	29,330

YTD in 2023 CDH performed 184 CT-IR procedures and projects 282 procedures for FY 2023 and 2024 and a 4% growth for the remainder of the projection period. YTD 2,712 CCTA scans have been performed and CDH projects 3,616 and 3,833 for FYs 2023 and 2024 respectively, a 6% increase. (The Applicant did not provide projections for CCTA but within the *Other* category, it currently comprises 20-25% of the total.) After an initial surge of 30.5%, growth projections are modest, less than 1% as Table 6 shows. The Year 1 growth is projected to occur for two main reasons: 1) the initial scheduling backlog will be addressed and 2) patients that may be leaving the region will be able to receive their needed scans in a timely manner at CDH. Following staff inquiry the Applicant states that in FY2022, 1,077 Cooley patients residing its service area sought CT services at another MGB facility.

After Year 1, growth is projected to fall into alignment with long-term demographic trends of approximately 1% per year.

### ***Analysis of Need***

The Proposed Project will address current and future needs of the Patient Panel by increasing CT capacity at CDH. As discussed above, it is clear that over a third of all CT scans originate within the ED and thus it is reasonable to locate a unit in that location; by eliminating the need to transport ED patients to CT in the radiology department, efficiencies and timely access will be gained. Having a CT unit embedded in the ED will allow the hospital to shift ED volume (over 26,000 scans) to the new unit.

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<sup>18</sup> Includes CCTA

A third unit will provide capacity to accommodate non-emergent patients, thereby minimizing disruptions in care delivery, provide timely appointment access to CT and reduce travel time out of the service area, for outpatients; and for inpatients, it will potentially reducing lengths of stay by providing earlier diagnosis and treatment. It will also create capacity for LDCT, CCTA and CT-IR procedures. Upon staff inquiry, the Applicant provided assurances that there is a multidisciplinary team at CDH to provide follow-up diagnostics and treatment for patients who screen positive for abnormalities detected and, the ability to refer higher acuity patients to an AMC.

Therefore, the Proposed Project should improve access to care, and improve the patient experience. CCTA has become a gatekeeper to the catheterization laboratory as a negative CCTA of sufficient quality virtually rules out obstructive CAD and significantly reduces unnecessary invasive procedures.<sup>f</sup>

## **Factor 1: b) Public Health Value through Improved Health Outcomes and Quality Of Life; Assurances Of Health Equity**

### **Improved health outcomes and quality of life.**

The use of diagnostic imaging in the United States, including CT, has increased due to advancements in technology (e.g., improvements in techniques, resolution, and acquisition time), expansion of clinical applications (including those to diagnose and treat age-related conditions), and patient and physician generated need/demand.<sup>g, h</sup>

The Applicant cites evidence-based literature regarding the efficacy and utility of CT technology as an essential component of care: it relies on this to maintain that elective and emergency CT imaging leads to improved public health outcomes and quality of life. The development and improvement in advanced diagnostic imaging technologies is widely credited with leading to improved patient outcomes, resulting from earlier and more accurate diagnoses of disease, using less or non-invasive techniques, and improved patient care processes.<sup>i</sup> Many CT scans can be performed in minutes, which enables rapid detection and diagnosis of emergent conditions.

Since CT utilizes cross-sectional x-ray images to create 3D images of bones, blood vessels and soft tissue,<sup>j</sup> it is useful in detecting tumors or lesions within the abdomen and lungs; heart disease or abnormalities of the heart; head injuries, blood clots and embolisms.<sup>k</sup> As a result, CT is a useful diagnostic tool detecting diseases and trauma; treatment planning and guiding procedures; and monitoring the effectiveness of select therapies.<sup>l</sup>

CT imaging is essential to timely diagnose and to differentiate the type of stroke (Ischemic or Hemorrhagic) that a patient is experiencing to enable timely appropriate treatment and to optimize the chance for positive patient outcomes.<sup>m, n</sup> Additionally, the detailed images produced by the CT scan can rule out other brain abnormalities.<sup>o</sup> 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 at the hospital, and IV thrombolytic ("tPA")

treatment should begin within one hour of patient arrival when indicated for Ischemic stroke.<sup>p</sup> As discussed above, CDH meets these guidelines over 80% of the time.

CT-IR is used to perform both diagnostic and therapeutic medical procedures for neurological conditions, cancer, heart disease, spinal problems, and vascular disease, among others.<sup>q</sup> The new CT will be a dual source energy scanner that simultaneously uses two x-ray energy spectra to capture images which improves anatomical differentiation; most CT has limited ability to differentiate soft tissue.<sup>r, s</sup> This CT will enable CDH perform CCTA to visualize coronary arteries to aide in diagnosis of heart disease and determine the appropriate intervention.<sup>t</sup>

Upon staff inquiry, the Applicant noted that within the region of Hampshire County, there are two health disparities in addition to the aging population, that the CT may positively impact, and improve public health outcomes. There is a higher prevalence of heart disease among Black and African American patients in Hampshire County and a corresponding higher rate of emergency department utilization for heart disease among Black and African American patients than other races/ethnicities: the rate of ED utilization for Black and African American patients is 584 per 100,000 (age adjusted) compared to 393 for White patients. In Easthampton the rate is 1059 for Black and African American patients compared to 345 for White patients.<sup>19</sup>

Additionally, Hampshire County is experiencing a shift in resident demographics, with Black and African American population growing 19.9% from 2019 to 2020, as well as Two or more races growing 206.2% (U.S. Census Bureau). Given these trends, CDH anticipates an increased need for CT related to heart disease.

Additionally, the rate of adult smoking in 2020 in Hampshire County is 13%.<sup>20</sup> However, according to the 2022 American Lung Association State of Lung Cancer Report, the percentage of eligible individuals receiving lung cancer screenings was only 16.3%, meaning there is large gap between eligible individuals and those receiving screenings. The Applicant did not provide data on the percentage of smokers in Hampshire County who eligible for, and who actually receive screening,

Citing the literature, the Applicant notes patient satisfaction is an important indicator for measuring quality in healthcare as it impacts clinical outcomes, patient retention, and medical malpractice claims; and further, timely, efficient, patient-centered care directly influences patient satisfaction.<sup>u</sup> The Applicant asserts the Proposed Project will maintain patient satisfaction by ensuring that patients will not experience extensive delays or need to travel outside the service area to access needed CT services.

### ***Analysis***

Staff acknowledges that providing timely access to advanced imaging contributes to improved health outcomes and patient satisfaction. Advanced imaging can improve disease diagnosis treatment and monitoring, which can lower the use of more invasive and costly procedures,<sup>v</sup>

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<sup>19</sup> MDPH Hospital Admissions data.

<sup>20</sup> County Health Rankings

and positively affect health outcomes through reduced recovery times and lower infection rates.

Staff affirms the need for community access to CT services, especially among the *65 and over* cohort which comprises nearly 30% of CDH's patient population, for whom travel outside of the service area poses a greater burden. Risk for cancer, cardiovascular disease, and Alzheimer's, the leading causes of death in Massachusetts, increase with age, and consequently demand for the proposed imaging services is likely to increase with a growing aging population.<sup>w</sup>

### **Health Equity and Social Determinants of Health (SDOH)**

The Applicant asserts that to ensure health equity for all populations, including those deemed underserved, the Proposed Project will not affect accessibility of CDH's services to economically disadvantaged, medically indigent and/or Medicaid eligible individuals. CDH does not discriminate based on ability to pay or payer source and this practice will continue following implementation of the Proposed Project.

In order to identify areas of disparity, CDH collects and analyzes patient demographic data including race, ethnicity, language, disability, sexual orientation, and gender identity, and plans to add veteran status in 2023.

Medical interpreter services are available at CDH, including for CT patients. The most requested languages are Spanish, American Sign Language, Chinese-Mandarin, Vietnamese, and Khmer/Cambodian. Bilingual staff are available to provide direct services to Spanish-speaking patients, and outside vendors are retained for other languages along with video remote interpreter services. Additionally, CDH has a Qualified Bilingual Support program where staff and providers are assessed for competency to speak directly with patients in a language other than English.

The Applicant provided examples of its progress in ensuring equity across the MGB system, these are included in Appendix II.

Staff inquired about SDOH measures implemented that are specific to CDH. The hospital has implemented gender neutral restrooms, where all signage was changed to reflect that status since all are single occupancy.

The CT table can be lowered to accommodate older patients, and the space will include installing flooring that is slip resistant (with texture), and lighter colored so patients can acclimate themselves to stepping onto the floor from a stretcher, as well as using color transitions that assist those with weaker eyesight. The units also can be lowered to 20 inches, have microphones with adjustable volume, have visual aids for breathing instructions for patients with hearing limitations, and in addition to wheelchairs and stretchers, walkers are available to patients.

### **Analysis**

As described herein, the Applicant provided descriptions of its programs designed to improve health equity, and inclusion. The Applicant stresses that CDH is committed to promoting health

equity, ensuring patients can access the Hospital's services and effectively communicate with their providers, and offers a variety of services to address SDOH and health disparities. The Applicant anticipates the Proposed Project will result in improved patient experience, quality outcomes and equity. Staff believes the programs described will improve access to CT imaging for those deemed underserved in the region, and for whom travel beyond the service area can pose additional challenges, and as a result the Proposed Project and may ultimately improve health outcomes for all patients whose clinical condition benefit from CT scans.

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

The Applicant asserts the Proposed Project will ensure continuity of care, improved health outcomes, and enhanced quality of life in several ways.

Having the CT scanner embedded in the ED will increase efficiency and collaboration between the ED team and Radiology; and by establishing Radiology as part of the ED team, it is anticipated that workflows will be enhanced, and morale and collaboration among the departments improved. Further, radiology will have ongoing access to ED resources and staff will be more readily available to help with the clinical care of ED patients who undergo imaging. All ED critical findings, including radiology will be communicated using the Critical Results System - Alert Notification of Critical Results ("ANCR"),<sup>21</sup> which provides immediate results for critical findings within the ED and automatically to the referring physicians. Efficiencies will also be gained since ED patients will no longer need to be transported to Radiology.

Additionally, CDH's electronic medical record ("EMR") is integrated ensure continuity and coordination of care among the Hospital clinicians, community primary care and members of the care team such as case management and social work support which leads to improved health outcomes, and enhanced quality of life.

#### ***Analysis***

Staff notes that care fragmentation can occur when healthcare delivery is spread across a number of separately located and operated providers with disparate systems that lack interoperability. This can be a source of inefficiency and ineffectiveness in healthcare and a source of dissatisfaction for patients.<sup>x</sup>

The Proposed Project will help to prevent fragmentation by embedding CT within the ED and by providing adequate CT resources such that wait-times and travel outside the region for such services will be reduced. Co-located services such as CT within the ED, will not only reduce the likelihood of fragmented care, it will also increase collaboration among providers and efficiencies caused by delays in care, both of which contribute to improved health outcomes.

The newer CT unit will be capable of performing a broader array of scans including CT-IR and CCTA thereby yield improvements in the range and quality of imaging. It will also be faster

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<sup>21</sup> which is a closed loop communication for all ED cases 24 hours a day, 7 days a week.

thereby reducing turnaround times and improve access to imaging, while improving operational efficiencies.

The Applicant has an integrated health information system. Review of the literature suggests access to integrated health information technology systems directly impacts health outcomes through reducing fragmentation and improving coordination among care providers.<sup>y, z</sup> 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.<sup>aa</sup>

### **Factor 1: d) Consultation**

The Applicant has provided evidence of consultation, both prior to and after the Filing Date, 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 within the Patient Panel**

The Department's Guideline<sup>22</sup> 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."<sup>23</sup>

To ensure sound community engagement throughout the development of the Proposed Project, the Applicant took the following actions:

- PFAC presentation on November 15, 2022. Fourteen (14) individuals were in attendance.
- Healthy Communities Committee presentation on February 13, 2023. Sixteen (16) individuals were in attendance.
- Public Forum presentation on March 2, 2023. Sixteen (16) individuals were in attendance.

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.

### ***Analysis***

Staff finds that the Applicant sought to engage the community to elicit feedback from patients and families regarding the Proposed Project and thereby the Applicant has met the minimum

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<sup>22</sup> Community Engagement Standards for Community Health Planning Guideline

<sup>23</sup> DoN Regulation 100.210 (A)(1)(e). [Available at https://www.mass.gov/files/documents/2018/12/31/jud-lib-105cmr100.pdf](https://www.mass.gov/files/documents/2018/12/31/jud-lib-105cmr100.pdf)

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 asserts that the Proposed Project will not have an adverse effect on competition in the Massachusetts healthcare market based on price, TME, provider costs, or other recognized measures of healthcare spending based on the following.

The Applicant states the third CT unit in the ED will require one full time CT technologist, which will have a minimal impact on operating costs. Additionally, since CDH's existing 2 CTs are operating near full capacity, the ED CT may eliminate cost increases due to delayed treatment. When wait times for CT imaging, particularly for outpatients and patients requiring interventional CT are prolonged, delayed diagnosis and treatment can result in a decline in the patient's medical condition and increases in the overall cost of care. The third CT unit will improve access to CT interventional procedures that expedite diagnosis and treatment, thereby avoiding more potentially more invasive and costly procedures. The Applicant asserts that to improve health outcomes and contain overall medical costs, hospitals must have the ability to provide access to CT imaging by delivering quality, timely care and therefore, the Proposed Project is necessary to meet patients' needs.

#### ***Analysis Factor 1***

Staff finds that the Applicant has made a reasonable argument for an additional unit to meet existing demand, the demands of a growing and aging population, the expanded clinical protocols for stroke and LDCT and the increasing clinical applications within CT-IR.

While advanced imaging improves clinical care, it is also the source of overuse and added healthcare costs.<sup>bb</sup> Staff notes that excessive imaging remains a concern in the Commonwealth with Massachusetts ranking fourth in the nation in Medicare spending for imaging.<sup>cc</sup> Overuse of imaging may lead to lower quality care as a result of worry, and unnecessary healthcare interventions including follow-up tests, treatments, visits, hospitalizations, and increased healthcare spending.<sup>dd</sup> Staff also notes that CMS has delayed indefinitely, the final implementation of Clinical Decision Support Mechanism (CDSM) mandate which will ultimately require new compliance measures when healthcare professionals order outpatient advanced imaging.<sup>24</sup>

Staff finds that, given that there will be no change in CDH's contracted rates for CT services resulting from the Proposed Project, 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.

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<sup>24</sup> Initially CMS has delayed implementation of the Appropriate Use Criteria program to the Jan. 1 to following the end of the COVID-19 public health emergency, but it has now been delayed indefinitely.



The Applicant proposed specific outcome, and process measures to track the impact of the Proposed Project which staff has reviewed, and which will become a part of the reporting requirements. The measures are listed below in Appendix I.

As a result of information provided by the Applicant and additional analysis, staff finds that the Applicant has demonstrated that the Proposed Project has met Factor 1(a-f).

## **Factor 2: Cost Containment, Improved Public Health Outcomes and Delivery System Transformation**

### **Cost Containment**

The Applicant states that the Proposed Project seeks to meaningfully contribute to the Massachusetts goals of cost containment by providing high-quality imaging services for patients in a cost-effective, community-based setting. Further, the Proposed Project seeks to improve timely access to an essential component of hospital care, CT imaging, which facilitates timely diagnosis thereby allowing treatment to begin earlier in the disease process. As a result, this can reduce costs as discussed in depth under Factor 1. Accordingly, the Proposed Project will contribute to the Commonwealth's goals of cost containment by having a negligible to positive impact on costs while ensuring timely access to care.

#### ***Analysis: Cost Containment***

As described above, the Proposed Project seeks to provide continued access to imaging services without any increases in negotiated rates for CDH and the potential to hold costs steady through reductions in costs associated with delayed care and the use of more invasive diagnostic and treatment tools. Therefore, DoN staff can conclude that the Proposed Project will likely meet the cost containment elements of Factor 2.

### **Improved Public Health Outcomes**

As discussed in this Application, the Applicant anticipates demand for CT imaging will continue to increase as the CDH Patient Panel grows and ages. To ensure timely access to CT imaging it is necessary to have adequate capacity that the addition of a third CT unit will provide. Timely access will be measured by improving door to CT time for stroke patients, reducing wait times for outpatients and expanding availability IR-CT. More timely access will facilitate treatment and result in improved patient experience and public health outcomes.

#### ***Analysis: Public Health Outcomes***

As mentioned above, ensuring timely access to coordinated imaging services can reduce delays in diagnosis and treatment (which can adversely impact health outcomes), and thus contribute to improved health outcomes and patient satisfaction.

### **Delivery System Transformation**

The Applicant states that MGB and CDH have numerous programs in place to ensure linkages to social service organizations. For instance, patients of Cooley Hospital Physicians' Organization, the Hospital's affiliated medical group, are screened for SDOH including housing, access to food, transportation, and education. Patients complete the screening using an iPad and are offered staff assistance as needed. Patients who screen positively are referred to an interdisciplinary team of nurses and social workers who identify patients' health risks, coordinate care between providers and services, and facilitate communications and transitions between hospital, rehabilitation facilities, community-based programs, and home as appropriate. The program also maintains a database of local resources for patients. Staff inquired whether ED patients at CDH are screened for SDOH to which the Applicant responded there is a plan to begin screening soon.

### ***Analysis: Delivery System Transformation***

Staff notes that with its efforts to identify SDOH disparities and implement solutions, the Applicant is showing its commitment to the issue, and it is imperative for efforts to make inroads particularly given the reported increasing diversity within the region.

Central to the goal of Delivery System Transformation is the integration of social services and community-based expertise. SDOH screening is integrated into the Applicant's care processes, to address health risks and improve health outcomes. Persistent disparities in a number of health outcomes, including the leading causes of death, indicate the important influence of the social determinants in health prevention and disease promotion.<sup>ee</sup> Providing access to LDCT for lung cancer in the region is one step to improving health outcomes.

### ***Analysis FACTOR 2***

As a result of information provided by the Applicant and additional analysis, staff finds that the Applicant has demonstrated that the Proposed Project has met 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 will not be addressed further in this report.

## **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 scope of the CPA Report, performed by BDO, is limited to an analysis of the six-year Projections for the fiscal years 2023, through 2028, prepared by Management, and the supporting documentation. To gain an understanding of MGB and CDH and to render an opinion on the reasonableness of assumptions and feasibility of the Proposed Project, the CPA

reviewed and analyzed historical and prospective financial information provided by MGB Management between February and May 2023, including:

1. Six-Year Pro-Forma Statements (Projections) for the fiscal years ending 2023 through 2028, provided February 17, 2023, updated on March 3, 2023, updated again on June 22, 2023;
2. Projected income statements for the CDH new CT unit, including detailed assumptions for the first five years of operations;
3. CDH CT Scan Department income statements for fiscal years 2021 and 2022;
4. Schedule of Estimated Total Capital Expenditure (Factor 4 Form F4a.ii);
5. Audited Financial Statements of MGB Incorporated and Affiliates as of and for the years ended September 30, 2022, and 2021;
6. Multi-Year Financial Framework of MGB Incorporated for the fiscal years ending 2023 through 2027 prepared for MGB Finance Committee as of November 11, 2022;
7. Consolidated Balance Sheet and Statements of Operations of MGB and Affiliates, which includes CDH, as of and for the years ended September 30, 2021, and 2022;
8. Company website – <https://www.massgeneralbrigham.org>; CDH website – <https://www.cooleydickinson.org>;

The CPA report also analyzed Key Metrics,<sup>25</sup> which are used to assist in the evaluation of management performance of how efficiently resources are utilized.<sup>26</sup>

#### 1. Revenues

Since the net patient service revenue is the only revenue category impacted by the Proposed Project, the CPA only analyzed this category of historical and projected financial information. The analysis determined that the proposed capital project would represent approximately 0.0148% (1.5 one-hundredth of 1%) of MGB net patient service revenue in FY 2025, and approximately .0172% (< 2 one-hundredths of 1%) of MGB net patient service revenue in FY 2028. The first year in which revenue is present for the proposed capital project is FY 2025.

The CPA concluded that the revenue growth projected by the Applicant reflects a reasonable estimation based primarily upon the Company's historical operations, excluding FY 2020 due to the financial impact of the COVID-19 pandemic.

#### 2. Operating Expenses

The CPA analyzed operating expenses for reasonableness and feasibility as it relates to the projected revenue items including actual operating results for MGB for the years ended 2021 and 2022 to determine the impact of the proposed capital project at CDH on the consolidated entity and to determine the reasonableness of the Projections for the fiscal years 2023 through

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<sup>25</sup> Financial Ratios fall into three primary categories: profitability, liquidity, and solvency. Profitability metrics, such as EBIDA, EBIDA Margin, Operating Margin, Total Margin, and Debt Service Coverage Ratio

<sup>26</sup> See CPA report <https://www.mass.gov/doc/cpa-report-pdf-mass-general-brigham-incorporated/download>

2028. Based upon this analysis, the proposed capital project would represent ~0.0011% (~1-one thousandths of 1%) of MGB operating expenses in FY 2025, and ~0.0019% (~2-one thousandths of 1%) of MGB operating expenses in FY 2028.

As a result, the CPA concluded the growth in operating expenses projected by Management reflects a reasonable estimation based primarily upon the Company's historical operations, excluding FY 2020 due to the financial impact of the COVID -19 pandemic.

### 3. Nonoperating Gains/Expenses and Other Changes in Net Assets

The final categories of MGB Projections are various nonoperating gains/expenses and other changes in net assets. The CPA analyzed the nonoperating activity in aggregate and determined that there were no nonoperating expenses projected for the Proposed Project at CDH and that the pro-forma nonoperating gains/expenses and other changes in net assets are reasonable.

### 4. Capital Expenditures and Cash Flows

The CPA reviewed MGB's capital expenditures and cash flows and had discussions with Management to determine whether it anticipated reinvesting sufficient funds for technological upgrades to property, plant and equipment and whether the cash flow would be able to support that reinvestment.

The CPA also considered the current and projected capital project and loan financing obligations included within the Projections and the impact of those projected expenditures on MGB cash flow and concluded that the pro-forma capital expenditures and their impact on MGB cash flows are reasonable.

### CPA's Conclusion

The CPA's analysis reflects that the Proposed Project has a relatively insignificant impact on the operations and financial position of MGB. Consequently, the CPA determined that the Projections are not likely to result in insufficient funds for capital and ongoing operating costs necessary to support the Proposed Project and determined the projections are reasonable and based upon feasible financial assumptions. Therefore, the proposed new CT unit at CDH is financially feasible and within the financial capability of MGB and not likely to have a negative impact of the Applicant's patient panel.

### ***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**

Factor 5 requires a review of, 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 must

provide 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).

The Applicant reports that it evaluated and rejected one alternative to the proposed project: maintaining the status quo and continue to serve patients with just two CT units. Through the addition of one dedicated CT unit in the emergency department the Applicant asserts the Proposed Project is the superior option due to the following:

**Quality:** Maintaining the status quo will not achieve the improvements to quality that the expanded capacity will have to address delays in access that occur. First, patients including those with potential trauma or stroke, who present in the ED are appropriately prioritized, over scheduled inpatients and outpatients thereby potentially delaying diagnosis and treatments and negatively impacting outcomes. Further, the unit will eliminate the need for patients to travel to interventional radiology procedures. Older patients for whom travel poses a greater burden and for whom delays in diagnosis and treatment can result in diminished outcomes will benefit from these improvements.

**Efficiency:** A third CT unit will eliminate disruptions and rescheduling of patients' CTs as a result of need to prioritize ED CTs. With no expansion, CDH will continue to be strained since demand for CT continues to grow; and when outpatient scans are delayed or must be rescheduled, non-emergent patients will experience increasing wait times thereby delaying access and diminishing efficiency.

**Capital Expense:** The capital expenditure for the additional CT unit is \$2,516,623.00, whereas maintaining the status quo will have no capital costs.

**Operating Costs:** The first-year incremental operating expense of the Proposed Project is \$229,830. By year five (5), operating costs are estimated at \$468,845, while there would be no additional operating costs if no expansion occurs.

### ***Analysis***

The Proposed Project was chosen as the best alternative to meet the needs of Patient Panel since as described further in Factor 1, Quality and Efficiency of care delivery may be improved.

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 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**

***Summary and relevant background and context for this application:*** This is a DoN project that will result in a Tier 1 Community-based Health Initiative (CHI). The Applicant, Mass General Brigham Incorporated at Cooley Dickinson Hospital (CDH), plans to acquire a computed tomography (CT) Unit. Since this project constitutes as DoN-Required

Equipment obtained by a hospital, standard practice is to contribute the CHI dollars to a local CHI project and the Statewide Community Health and Healthy Aging Funds.

To fulfill Factor 6 requirements, the Applicant submitted a CHI Narrative, its existing 2022 Community Health Needs Assessment, a Self-Assessment, and Stakeholder Assessments.

**The 2022 Community Health Needs Assessment (CHNA)** was conducted in partnership with the Coalition of Western Massachusetts Hospitals/Insurers (“the Coalition”), in which CDH is a member. The Coalition is a network formed in 2012 that consists of 9 non-profit hospitals and insurers in the region and works to coordinate resources and activities to advance health equity and conduct the CHNA. For the 2022 CHNA, the Coalition worked with the Public Health Institute of Western MA to conduct the Assessment.

Building off the 2016 and 2019 reports, the 2022 CHNA more specifically highlights the relationship between health behaviors and outcomes with the social determinants of health. The current CHNA also integrated community feedback to inform data collection needs and health priorities. This process consisted of a literature review of previous and existing reports, surveying public health officials, an analysis of quantitative data with efforts to disaggregate (e.g., by race, ethnicity, gender, age, LGBTQIA+, rural) to understand health inequities. Subsequent qualitative data was collected in the form of informational interviews and focus groups centered on youth mental health and wellbeing. Focus populations of this CHNA included members of the Black community and folks from communities of color, as well as individuals who identify as transgender and non-binary.

Key health-related social needs identified in the CHNA include community and social environment, digital equity, transit, food access and physical activity, housing, violence and lack of resources to meet basic needs. Additionally, community needs in terms of health behaviors and outcomes include asthma, heart disease, stroke, mental health, and COVID/long COVID.

**The Self-Assessment** provided a summary of community engagement processes and socio-demographic information, data and highlights related to topics and themes of community needs. Through data analysis, existing surveys, and key informant interviews, the participating community groups and residents identified the key concerns outlined in the 2022 CHNA.

**Stakeholder Assessments** submitted provided information on the individuals’ engagement levels (e.g. their personal participation and role) and their analysis of how the Applicant engaged the community in community health improvement planning processes. The information provided in these forms were consistent with the self-assessment conducted by the Applicant.

**The CHI Narrative** provided information on the Applicant’s decision-making structure and governing body for the CHI funding decision. The Applicant reported that the CHI Advisory Committee will begin meeting and identifying CHI Health Priorities at 6 weeks post-project approval. Within a year of approval, the Applicant plans to disburse the funds, and complete

final evaluations of funded project(s) within two years of approval. Administrative monies will support the promotion of meetings, interpretation/translation services, community engagement efforts.

DPH will work with the Applicant to ensure ongoing community engagement, a feasible project timeline and appropriate stewardship of the administrative allowance. Administrative allowances are used to address barriers to participation for community to engage in the community health planning process.

### ***Analysis***

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

### **Overall 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 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 \$125,831.15
  - a. \$12,079.79 will be directed to the CHI Statewide Initiative
  - b. \$108,718.11 will be dedicated to local approaches to the DoN Health Priorities
  - c. \$5,033.25 may 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 \$12,079.79 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.

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

The Applicant provided several metrics that it will monitor regularly to assess the impact of the Proposed Project. These will be reported to the DoN program on an annual basis following project implementation. *Reporting will include a description of numerators and denominators.* The measures are discussed below:

1. Timely Access – Door to CT for Stroke Patients: Adding a third CT unit in the ED will likely decrease time from door to CT for stroke patients. As a result, stroke patients will receive a timely diagnosis that will direct subsequent medical treatment.  
**Measure:** Length of time between when patient reaches the Hospital to when a CT scan begins.  
**Baseline:** Average door to CT scan time: 62.80 minutes  
**Projections:** Year 1: 56.51 minutes; Year 2: 50.86 minutes; and Year 3: 45.77 minutes
2. Access – Outpatient wait times will decrease.  
**Measure:** Median days for patient to get scheduled for CT scan.<sup>27</sup>  
**Baseline:** Average wait time is 14 days.  
**Projections:** Year 1: 7 days; Year 2: 6 days; and Year 3: 5 days
3. Patient Experience Scores: Patients that are satisfied with care are more likely to seek additional treatment when necessary. Timely access to CT scans likely will improve patient experience.  
**Measure:** Overall rating of experience.  
**Baseline:** 83%<sup>28</sup>  
**Projections:** Year 1: 85%; Year 2: 87%; and Year 3: 89%

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<sup>27</sup> This value will not include patients who need 3-month, 6-month or annual CT exams that are schedule in advance.

<sup>28</sup> Measured from March 2022 through February 2023.



## Appendix II

1. MGB recently invested \$50 million in community and mental health;
2. MGB launched United Against Racism, a statewide initiative for becoming an anti-racist organization that includes staff training to increase cultural competency including unconscious bias; requiring leaders to participate in diversity, equity, and inclusion training; committing to a series of specific timelines and metrics of success based on input from staff, leadership, and the Board. Highlights of those efforts include: removing race in clinical protocols where too often a patient's race has played a role in clinical decision tools and policies;
3. Increasing SDOH screening and resources to reduce health gaps such as food insecurity, housing needs, across 22 primary practices;
4. Improving access for all patients by hiring 11 bilingual digital access coordinators who collectively speak Spanish, Portuguese, Haitian, Creole, Arabic, Russian, Mandarin, Cantonese, and Cape Verdean Creole, and translating MGB's Patient Gateway platform into languages most commonly spoken by its patients;
5. Building a culture of health equity improvement by funding 18 grants that aim to reduce racial disparities in patient experience and/or outcomes, such as reducing disparities in the use of physical restraint in emergency departments and improving access to mental health treatment for non-English speaking trauma survivors;
6. Expanding on mobile community care that began during the COVID-19 pandemic;
7. Enhancing health equity leadership and accountability by hiring a chief community health equity officer and senior medical director for health equity - both highly respected clinicians with a lifelong dedication to providing all patients with exceptional care;
8. Participating in the Health Equity Index program of the Human Rights Campaign Foundation, which promotes policies and practices in health care settings that lead to greater equity for LGBTQ patients. The Applicant scored 100% in its most recent survey.

## Endnotes

- <sup>a</sup> Center for Health Information and Analysis. Massachusetts Hospital Profiles. Technical Appendix. <https://www.chiamass.gov/assets/docs/r/hospital-profiles/2019/FY19-Massachusetts-Hospital-Profiles-Technical-Appendix.pdf>
- <sup>b</sup> Full List of MassHealth Accountable Care Organizations and Managed Care Organizations <https://www.mass.gov/service-details/full-list-of-masshealth-acos-and-mcos>
- <sup>c</sup> Massachusetts Health Policy Commission. Health Policy Commission ACO Certification Program Accountable Care Organizations In Massachusetts: Profiles of The 2019 and 2020 HPC-Certified ACOs. Available: <https://www.mass.gov/doc/accountable-care-organizations-in-massachusetts-profiles-of-the-2019-and-2020-hpc-certified-acos/download>
- <sup>d</sup> Rebecca Smith-Bindman et al., *Rising Use Of Diagnostic Medical Imaging In A Large Integrated Health System*, 27 Health Affairs 1491 (2008), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2765780/pdf/nihms-137739.pdf>; Rebecca Smith-Bindman et al., *Use of Diagnostic Imaging Studies and Associated Radiation Exposure For Patients Enrolled in Large Integrated Healthcare Systems, 1996-2010*, JAMA Network (June 13, 2012), <https://jamanetwork.com/journals/jama/fullarticle/1182858>; Robert J. McDonald et al., *The Effects of Changes in Utilization and Technological Advancements of Cross-Sectional Imaging on Radiologist Workload*, 22 Academic Radiology 1191 (2015); Michael Walter, *Feeling overworked? Rise in CT, MRI images adds to radiologist workload*, Radiology Business (Jul. 31, 2015), <https://radiologybusiness.com/topics/medical-imaging/magnetic-resonance-imaging-mri/feeling-overworked-rise-ct-mri-images-adds>; *Increases in Imaging Procedures, Chronic Diseases Spur Growth of Medical Imaging Informatics Market*, Imaging Technology News (Oct. 28, 2016), <https://www.itnonline.com/content/increases-imaging-procedures-chronic-diseases-spur-growth-medical-imaging-informatics>.
- <sup>e</sup> Kathleen Lang et al., National trends in advanced outpatient diagnostic imaging utilization: an analysis of the medical expenditure panel survey, 2000-2009, BMC Med. Imaging, (2013) available at <https://pubmed.ncbi.nlm.nih.gov/24279724/>.
- <sup>f</sup> Danad I, Raijmakers PG, Knaapen P. Diagnosing coronary artery disease with hybrid PET/CT: it takes two to tango. *J Nucl Cardiol*. 2013; 20:874–890. doi: 10.1007/s12350-013-9753-8
- <sup>g</sup> Smith-Bindman et al., *supra* note d; Lang et al., *supra* note e.
- <sup>h</sup> Health Affairs, *supra* note d; Jama Network, *supra* note d; McDonald et al., *supra* note d; Walter et al., *supra* note d; Imaging Technology News, *supra* note d.
- <sup>i</sup> Health Affairs, *supra* note d; Jama Network, *supra* note d; McDonald et al., *supra* note d; Walter et al., *supra* note d; Imaging Technology News, *supra* note d.
- <sup>j</sup> See *Computed Tomography (CT)*, Nat'l Inst. of Biomedical Imaging and Bioengineering, <https://www.nibib.nih.gov/science-education/science-topics/computed-tomography-ct> (last visited Feb. 24, 2022); *CT Scan*, Mayo Clinic, <https://www.mayoclinic.org/tests-procedures/ct-scan/about/pac-20393675> (last visited Feb. 24, 2022).
- <sup>k</sup> See Yvette Brazier, *How Does a CT or CAT scan work?*, MedicalNewsToday, <https://www.medicalnewstoday.com/articles/153201#procedure> (last modified June 23, 2017).
- <sup>l</sup> Carlo Liguori et al., *Emerging clinical applications of computed tomography*, 8 Med. Devices 265 (2015), available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4467659/>; *Computed Tomography*, RadiologyInfo.org, <https://www.radiologyinfo.org/en/submenu.cfm?pg=ctscan> (last visited Jun. 29, 2018); *Computed Tomography (CT)*, U.S. Food & Drug Administration, <https://www.fda.gov/radiation-emitting-products/medical-x-ray-imaging/computed-tomography-ct> (last updated Mar. 7, 2018).
- <sup>m</sup> Jeffrey L. Saver, M.D. et al., *Time to Treatment With Intravenous Tissue Plasminogen Activator and Outcome From Acute Ischemic Stroke*, JAMA Network (June 19 2013), <https://jamanetwork.com/journals/jama/fullarticle/1697967> (stating “In a registry representing US clinical practice, earlier thrombolytic treatment was associated with reduced mortality and symptomatic intracranial hemorrhage, and higher rates of independent ambulation at discharge and discharge to home following acute ischemic stroke.”).

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<sup>n</sup> See *Id.* (indicating there are two main types of strokes are ischemic stroke i.e. blocked artery or hemorrhagic stroke, a blood vessel bursting or leaking and indicating individuals may also experience a temporary disruption of blood flow to the brain, called a transient ischemic attack, but this does not tend to cause lasting symptoms).

<sup>o</sup> *Id.*

<sup>p</sup> See *Primary Stroke Services Time Target Recommendations*, Footnote 10.

<sup>q</sup> Elizabeth Hanes, RN, What is Interventional Radiology?, DignityHealth, <https://www.dignityhealth.org/articles/what-is-interventional-radiology> (Aug. 26, 2017).

<sup>r</sup> What is Dual Source Energy? Siemens Healthineers <https://www.siemens-healthineers.com/en-us/computed-tomography/dual-energy/dual-source-dual-energy#:~:text=With%20Dual%20Source%20CT%20it,reducing%20the%20radiation%20dose%20significantly> (last visited March 7, 2023).

<sup>s</sup> Hyun Woo Goo, MD, Jin Mo Goo, MD PhD, *Dual-Energy CT: New Horizon in Medical Imaging*, [Korean J Radiol.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5447632/) 2017 Jul-Aug; 18(4): 555–569 (available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5447632/> ).

<sup>t</sup> Coronary CTA, RadiologyInfo.org available at <https://www.radiologyinfo.org/en/info/angiocorocroct> (last visited March 8, 2023).

<sup>u</sup> Prakash B. Patient satisfaction. *J Cutan Aesthet Surg.* 2010;3(3):151-155. doi:10.4103/0974-2077.74491. [Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3047732/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3047732/)

<sup>v</sup> 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.

<sup>w</sup> CDC. Stats of the State of Massachusetts. [Available at https://www.cdc.gov/nchs/pressroom/states/massachusetts/massachusetts.htm](https://www.cdc.gov/nchs/pressroom/states/massachusetts/massachusetts.htm)

<sup>x</sup> The Problem of Fragmentation and the Need for Integrative Solutions. Kurt C. Stange *The Annals of Family Medicine* Mar 2009, 7 (2) 100-103; DOI: 10.1370/afm.971. [Available at https://www.annfammed.org/content/7/2/100](https://www.annfammed.org/content/7/2/100)

<sup>y</sup> HealthIT.gov. Improve Care Coordination. [Available at https://www.healthit.gov/topic/health-it-basics/improve-care-coordination](https://www.healthit.gov/topic/health-it-basics/improve-care-coordination)

<sup>z</sup> 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.

<sup>aa</sup> HealthIT.gov, <https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/improved-diagnostics-patientoutcomes>

<sup>bb</sup> 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.

<sup>cc</sup> Massachusetts Health Policy Commission. 2018 Annual Health Care Cost Trends Report. [Available at https://www.mass.gov/files/documents/2019/02/20/2018%20Cost%20Trends%20Report.pdf](https://www.mass.gov/files/documents/2019/02/20/2018%20Cost%20Trends%20Report.pdf)

<sup>dd</sup> Litkowski PE, Smetana GW, Zeidel ML, Blanchard MS. Curbing the Urge to Image. *Am J Med.* 2016 Oct;129(10):1131-5. doi: 10.1016/j.amjmed.2016.06.020. Epub 2016 Jul 13. PMID: 27421918.

<sup>ee</sup> Singh GK, Daus GP, Allender M, et al. Social Determinants of Health in the United States: Addressing Major Health Inequality Trends for the Nation, 1935-2016. *Int J MCH AIDS.* 2017;6(2):139-164. doi:10.21106/ijma.236