STAFF REPORT TO THE PUBLIC HEALTH COUNCIL FOR A DETERMINATION OF NEED	
Applicant Name	South Shore Health System, Inc.
Applicant Address	55 Fogg Road, Weymouth, MA 02190
Filing Date	May 21, 2021
Type of DoN Application	Substantial Change in Service, DoN-Required Equipment
Total Value	$2,387,481.00
Project Number	21040109-HS
Ten Taxpayer Group (TTG)	None
Community Health Initiative (CHI)	$119,374.05
Staff Recommendation	Approval
Delegated Review	Final Action by Commissioner

Project Summary and Regulatory Review

South Shore Health System, Inc. (Applicant) submitted a DoN Application for the acquisition of one, 3 Tesla (3T) magnetic resonance imaging (MRI) unit to be located on the main campus of South Shore Hospital at 55 Fogg Road Weymouth, MA. The capital expenditure for the Proposed Project is $2,387,481; the Community Health Initiatives (CHI) contribution is $119,374.05.

This DoN application falls within the definition of Substantial Change in Service, DoN-Required Equipment and Services, 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.

Application Overview

South Shore Health System (SSHS or Applicant) is a not-for-profit health care system located in Southeastern Massachusetts serving patients across Norfolk and Plymouth Counties, including the cities/towns of Weymouth, Braintree, Quincy, Hingham, Marshfield, Plymouth, and Scituate. SSHS provides primary, specialty, and urgent care services. SSHS includes the following: South Shore Hospital (SSH or the Hospital), a 393-bed acute care hospital located in Weymouth, MA providing emergency care, inpatient and outpatient services; multiple outpatient satellites; urgent care centers; and a physician group of more than 300 primary care doctors and specialists.

The Applicant currently provides its Patient Panel with access to magnetic resonance imaging (MRI) services at SSH main campus, and the Hospital's two outpatient satellites: the Cancer Center and South Shore Orthopedics. The Applicant is proposing to add one 3 Tesla (3T) MRI unit at the SSH main campus in order to enhance access to timely MRI services for the Patient Panel. The Applicant attributes need for expanded access to MRI services to 1) address capacity constraints and 2) limitations in types of scans that can be performed on the existing MRI unit which increases wait times, and contributes to delayed diagnosis and treatment. Citing peer reviewed literature on the clinical utility of MRI and the benefits of increasing access to high-quality imaging for the Patient Panel, the Applicant asserts the Proposed Project will improve access to care, patient experience, health outcomes and quality of life.

OVERVIEW of PROPOSED PROJECT AND FACTOR REVIEW

Description	What's Needed to Meet Factor 1: Demonstration of need; improved health outcomes and quality of life; assurances of health equity; continuity and coordination of care; evidence of community engagement; and competition on recognized measures of health care spending.	What's Needed to Meet Factor 2: Demonstration of cost containment, improved public health outcomes, and delivery system transformation	Factors 3, 4 & 5[1]	What's Needed to Meet Factor 6: Demonstration of plans for fulfilling … responsibilities … in the DPH Community-based Health Initiatives Guideline.
	Staff Report finds			
	MEETS	**MEETS**	**MEETS**	**MEETS**
The Applicant is proposing to add one 3T MRI unit at South Shore Hospital main campus in order to increase Patient Panel access to high-quality MRI services.	✓	✓	✓	✓

[1] 3: Sufficient evidence of compliance and good standing with federal, state, and local laws and regulations
4: Sufficient documentation of the availability of sufficient funds for capital and ongoing operating costs necessary to support the Project without negative impacts or consequences to the Applicant's existing Patient Panel 5: The … Project, on balance, is superior to alternative and substitute methods for meeting … Patient Panel needs.

Patient Panel[2]

South Shore Health System (SSHS) Patient Panel consisted of 187,706 unique patients in fiscal year (FY)18, 197,180 unique patients in FY19, and 197,808 unique patients in FY20. The number of patients utilizing SSHS services has increased by 5.4% from FY18 to FY20. Table 2 below presents the FY20 demographic profile for SSHS and SSHS MRI patient populations.

Staff notes the following observations about the data below:

- **Age -** The majority of SSHS (58.3%) and SSHS MRI (55.7%) patient populations are between the ages of 18-64. The age 65 and older population comprise 23.6% of the SSHS patient population and 42.7% of SSHS MRI patient population.
- **Race/Ethnicity** – SSHS and SSHS MRI patients differ slightly by race/ethnicity: ~76% of SSHS patients identified as White/Caucasian whereas ~89% of SSHS MRI patients identified as White/Caucasian. Further, a slightly smaller percentage of SSHS MRI patients identified as Black or African American (2.5% versus 3.4%) and Asian/Pacific American (1.5% versus 2%), compared to the SSHS patient population. The Applicant states that the medical record system used across South Shore Health System, including South Shore Hospital, has the following options for patients to select their race: White/Caucasian, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, Other, Unknown and Decline to Answer. The category "Other" is typically selected if the patient does not fit into one of the above options. The Applicant notes that the category "Other" is not broken out and further defined in SSHS' medical record system. SSHS provides numerous options for a patient to select their ethnicity however, the category "Other" is not an option.

  The Applicant provided a breakdown of the Hispanic Indicators in FY20 for all of SSHS and SSHS MRI patients as is shown in Table 1 below.

Table 1: Hispanic Indicators (FY20)

Hispanic Indicator	SSHS	SSHS MRI Only
Cuban	0.02%	0.01%
Decline to Answer	0.50%	0.40%
Hispanic or Latino	0.16%	0.12%
Mexican, Mexican American, or Chicano/a	0.10%	0.09%
Not Hispanic, Latino/a, or Spanish origin	84.51%	94.40%
Other Hispanic, Latino/a, or Spanish origin	1.98%	1.25%
Puerto Rican	0.24%	0.13%
Unknown	10.60%	3.58%
(blank)	1.89%	0.01%
Total	**100%**	**100%**

[2] 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.

To understand Patient Panel access to MRI services, the Applicant will report annually on the utilization of MRI at SSH, the site of the Proposed Project, and stratify data by age, race/ethnicity and payer mix. This metric is described below in Appendix 1.

- **Primary Service Area –** The majority of SSHS and SSHS MRI patients reside in the Norfolk and Plymouth Counties.

Table 2: Overview of Patient Population

	SSHS patients	SSHS MRI patients
Total Unique Patients (FY20)	197,808	14,097
Gender		
Female	59%	60.4%
Male	41%	39.6%
Age		
0-17	18%	1.5%
18-64	58.3%	55.7%
65+	23.6%	42.7%
Race/Ethnicity[3]		
White	75.7%	89%
Black or African American	3.4%	2.5%
Asian/Pacific American	2%	1.5%
Other	14%	5.9%
Did not report	4.7%	0.6%
Patient Origin	70% of SSHS patients are from 17 communities[4]	70% of SSHS MRI patients are from 14 communities[5]

Table 3 below presents FY20 payer mix and alternative payment methods (APMs) for SSHS and SSHS MRI patient populations. Commercial payers are the primary payer source for SSHS patients and SSHS MRI patients, followed by Medicare.

Table 3: Payer Mix and APM Contracts

	SSHS patients	SSHS MRI patients
Payer Mix		
Commercial		
PPO/Indemnity	16.8%	21.55%
HMO/POS	31.3%	30.65%

[3] Self-reported.

[4] The Applicant states 70% of patients originate from the following 17 cities and towns comprising SSHS's service area in order of size: Weymouth, Hingham, Braintree, Marshfield, Plymouth, Rockland, Quincy, Scituate, Pembroke, Hanover, Duxbury, Norwell, Abington, Kingston, Hull, Whitman and Hanson.

[5] The Applicant states 70% of patients originate from the following 14 cities and towns in order of size: Weymouth, Hingham, Braintree, Marshfield, Quincy, Rockland, Scituate, Pembroke, Hanover, Hull, Plymouth, Abington, Duxbury, and Norwell.

MassHealth	2.8%	1.88%
Managed Medicaid	2.0%	1.15%
Commercial Medicare	8.6%	9.52%
Medicare FFS	31.1%	35.04%
All Other	7.4%	0.21%
Total	**100%**	**100%**
APM Contract Percentages		
ACO and APM Contracts	3.4%	4.4%
Non-ACO and Non-APM Contracts	96.6%	95.6%
Total	**100%**	**100%**

Factor 1: a) Patient Panel Need

The Applicant attributes Patient Panel need for expanded access to MR imaging to the following:

1. Need to address capacity constraints to reduce delays in access to imaging at SSH
2. Need to increase types of scans performed at SSH
3. Need for expanded capacity to address increasing demand for MR imaging

1. Reducing delays in access to imaging

a. Background

South Shore Health System (SSHS) currently has three 1.5T MRI units licensed to South Shore Hospital (SSH) as shown in Table 4 below. The units are located at SSH main campus, and two outpatient satellites: the Cancer Center, and South Shore Orthopedics.[6]

Table 4: SSHS MRI imaging Capacity

	Existing MRI Units	Proposed MRI Units	Total MRI Units After Project Implementation
South Shore Hospital	(1) 1.5T	(1) 3.0T	(1) 1.5T, (1) 3.0T
Cancer Center	(1) 1.5T		(1) 1.5T
Orthopedic Center	(1) 1.5T		(1) 1.5T

Table 5 below shows data from January 2021 through June 2021 on utilization of the existing MRI units, including weekly average scans. The Applicant states this utilization data show that each facility/center is operating at nearly 100% capacity. The Applicant notes that for each center, no-shows and/or last minute cancellations prevent the center from reaching 100% capacity.

[6] Hospital Satellites: South Shore Hospital Breast Care Center/Multispecialty Care located in South Weymouth, MA and the Center for Orthopedics, Spine, and Sports Medicine located in Hingham, MA.

Table 5: SSHS MRI Operating Capacity

	Days/Hours of Operation	**Capacity Per Week**	**Average Exams/Week** *(Jan-Jun 2021)*
Cancer Center	M-Th: 7am – 11pm F-Sa: 7am – 3:30pm	90 exams	89 exams
South Shore Orthopedics	M-Th: 7am – 11pm F-Sa: 7am – 3:30pm	85 exams	84 exams
South Shore Hospital Main Campus	Su-Sa: 7am – 11pm	136 exams	135 exams

The Applicant provided SSHS historical MRI scan volume for SSH, and the two outpatient centers, which is shown in Table 6 below. Total MRI scan volume increased by 2% from FY18 to FY19 and decreased by 9% from FY19 and FY20. The Applicant noted that during the COVID-19 pandemic, MRI utilization decreased slightly. The Applicant anticipates MRI volume will return to pre-pandemic levels and steadily increase in the future.

Table 6: SSHS MRI Scans by Location

	FY18	**FY19**	**FY20**
South Shore Hospital Main Campus	7,497	7,471	6,497
Cancer Center	4,019	4,386	4,285
South Shore Orthopedics	3,716	3,697	3,315
Total	**15,232**	**15,554**	**14,097**

The Application provided the number of unique MRI patients broken down by age cohort for FY19.[7] This information, which is shown in Table 7 below, demonstrate the following:

- The 18-54 age cohort was the largest single age cohort across all three sites representing 40% of Cancer Center MRI patients, 35% of South Shore Orthopedic patients, and 27% of SSH MRI patients.
- The combination of the three age cohorts that comprise the 65 and older population represent the largest group: 35% of Cancer Center MRI patients, 41% of South Shore Orthopedic MRI patients, and 53% of SSH MRI patients.
- MRI patients in the 65-74 age cohort comprised the largest percentage of MRI patients aged 65 and older across all three sites.

[7] Due to the impact of COVID-19 on MRI scan volume, staff is presenting the data for FY19 instead of FY20, the most recent year for which data are available.

Table 7: SSHS MRI Total Unique Patients by Age Cohort

Age Cohort	Cancer Center		South Shore Orthopedics		South Shore Hospital Main Campus	
	#	%	#	%	#	%
0-17	52	1.5%	35	1.1%	92	1.9%
18-54	1,370	39.9%	1102	34.8%	1,324	27.0%
55-64	815	23.7%	725	22.9%	863	17.6%
65-74	680	19.8%	678	21.4%	1022	20.9%
75-84	408	11.9%	458	14.5%	954	19.5%
85+	107	3.1%	166	5.2%	641	13.1%
Total	**3,432**	**100%**	**3,164**	**100%**	**4,896**	**100%**

b. Demand

SSHS offers MRI services to emergency room patients, inpatients and outpatients. The Applicant provided data on MRI utilization that show that roughly 73% of scans performed at the Hospital's main campus were for outpatients.[8] The Applicant states there were 7,472 total scans performed on 4,901 unique patients at SSH main campus in calendar year (CY) 2019.

In order to understand access to MRI services at the South Shore Hospital (SSH) where the proposed MRI will be implemented, the Applicant provided information on the racial/ethnic makeup of SSH MRI patients for FY20, which is shown in Table 8 below.

Table 8: SSH MRI Race/Ethnicity by Patient Status (FY20)

Race / Ethnicity	Emergency	Inpatient	Outpatient
American Indian or Alaska Native	0.50%	0.14%	0.23%
Asian	1.01%	1.76%	2.27%
Black or African American	1.51%	3.93%	3.10%
Decline to Answer	0.00%	0.05%	0.11%
Native Hawaiian or Other Pacific Islander	0.00%	0.03%	0.00%
Other	8.04%	3.08%	5.19%
Unknown	0.50%	0.71%	0.19%
White/Caucasian	88.44%	90.30%	88.91%
Total	**100%**	**100%**	**100%**

The Applicant also provided the information on the payer mix of SSH MRI patients for FY20, which is shown in Table 9 below.

[8] In FY19, for SSHS there were 10,837 unique MRI patients; 2,544 inpatients and 8,293 outpatients.

Table 9: SSH MRI Payer Mix by Patient Status (FY20)

Payer Mix	Emergency	Inpatient	Outpatient
All Other	9.55%	1.90%	2.50%
Commercial HMO/POS	29.15%	13.87%	23.43%
Commercial Medicare	2.01%	11.56%	11.96%
Commercial PPO/Indemnity	18.59%	11.48%	15.93%
Managed Medicaid	5.53%	2.80%	1.40%
Mass Health	18.09%	7.44%	6.28%
Medicare FFS	16.08%	50.12%	37.85%
Self-Pay	1.01%	0.82%	0.64%
Total	**100%**	**100%**	**100%**

The Applicant states that in some cases, a patient cannot access the SSH's current MRI unit because of 1) the unit's weight limit, and 2) the current unit is 18 years old and requires significant downtime for maintenance. Patients that are not able to be scanned on SSH's main campus MRI unit, are transferred via the Hospital-owned ambulance to one of the SSH's outpatient MRI facilities for imaging. In CY19, 224 patients were transported from SSH to SSH's outpatient MRI facilities and in CY20, 190 patients were transferred. The Applicant states the reason for each patient's transfer is not tracked in their medical record but notes that the most common reasons for patient transfers are 1) the patient is over the table limit at SSH; 2) the patient does not fit into the MRI scanner at SSH due to body habitus or physique/build; and 3) the patient has severe claustrophobia.[9]

The Applicant states that the current table has a limit of 300 lbs. and is 60cm in diameter. The proposed unit is capable of receiving patients up to 550 lbs., is 70cm in diameter, is shorter in length and includes a patient comfort system with a series of mirrors to minimize the claustrophobic effect for the patient. Further, the scanner room and patient spaces were designed to evoke a sense of calm and reduce patient anxiety and includes an illuminated ceiling above the MRI table that mimics the outdoors, and a design concept for finishes and materials that evoke the natural environment in and around the South Shore.

The Applicant states there was 4% downtime on the existing MRI unit at SSH as validated by GE Service reports. Further, calculations made by SSH's clinical team reflect a similar amount of downtime on the existing MRI unit: out of the 5,824 hours a year of operation (16 cases a day, 7 days a week, 52 weeks), there were 232 hours of downtime, which represents 3.98% of the existing MRI's operating capacity.[10] The Applicant states that SSH plans to replace the existing

[9] The Applicant notes that the scanner at the Cancer Center is shorter in length and wider providing the sense of a more open space.

[10] The Applicant states downtime is calculated by tallying the number of hours per year that the MRI scanner is unavailable due to scheduled or unscheduled downtime.

18-year-old 1.5T MRI unit with a new 1.5T machine concurrent with the addition of a 3T machine.

The Applicant asserts that transporting inpatients and emergency patients for imaging increases the risk of complications for complex and high acuity patients and negatively impacts patient satisfaction. In addition, transferring inpatients and emergency patients to one of the outpatient facilities for imaging can disrupt an appointment for a scheduled outpatient. The Applicant asserts that the Proposed Project is intended to greatly reduce or completely eliminate the need to transfer patients to SSHS outpatient facilities.

2. Increasing types of scans performed

SSH has only a 1.5T MRI unit and is not able to accommodate patients requiring MR imaging on a 3T MRI unit, which provides additional clinical capabilities and increases access to additional types of MR imaging. The Applicant maintains that 3T MRI is increasingly indicated for diagnosis of certain conditions and diseases, such as prostate cancer, brain and neck injuries, and for certain conditions found in premature birth neonates. Under the existing situation, SSH must refer patients whose condition is clinically indicated for 3T MR imaging outside of SSHS to obtain such imaging which, the Applicant states, delays Patient Panel access to care. In FY20, a total of 1,512 patients were referred outside SSHS for 3T MR imaging, including 984 patients that were referred for imaging of the prostate (approximately 82 patients per month), and 528 patients that were referred for all other imaging needs (approximately 44 patients per month).

3. Increasing demand for MRI services

The Applicant provided five-year projections of MRI scan volume at SSH for the existing 1.5T MRI unit and the proposed 3T MRI unit utilizing CY2019 data (a more accurate reflection of scan volume than COVID-19 impacted CY2020). The Applicant states the first year of operation is scheduled for calendar year (CY) 2022. Table 10 below shows projected MRI scans at the SSH main campus by type of MRI unit after project implementation. Scan volume is projected to increase by 8% from Year 1 to Year 5, and 3T MRI scans will make up ~52% of the total scan volume and 1.5T MRI scans will make up the remaining 48%. Differences in utilization of 3T vs 1.5T are discussed below in Factor 1b. The Applicant states the projections are based on historical demand and modest growth over time.

Table 10: Projected MRI Scans at SSH Main Campus

	Year 1	Year 2	Year 3	Year 4	Year 5
SSH 3T MRI	6,720	6,854	6,991	7,131	7,273
SSH 1.5T MRI	6,295	6,421	6,549	6,680	6,814
Total	**13,015**	**13,275**	**13,540**	**13,811**	**14,087**

In response to staff inquiry, the Applicant provided a further breakdown of year one projections by volume sources to further demonstrate Patient Panel need for MRI services. Year one projections are presented in Table 11 below. The Applicant notes the year one new volume projections shown in Table 11 are based on actual volume (6,497 scans) from FY2020. Because

Year 1 projected volume shown in Table 10 was calculated based on FY19 volume there is a slight (0.5%) discrepancy in the Year 1 projections between Tables 10 and 11. While FY 2020 volume was 13% lower than FY2019 due to the COVID-19 pandemic, utilizing FY20 as a basis for projecting growth still yields significant increase in volume. The applicant expects scan volumes to return to pre-pandemic levels as the pandemic lessens and predicts scan volume will be at least equivalent to 2019 volume (7,471 scans) and likely higher due to delayed care during the COVID-19 pandemic and ongoing population growth. With this expectation, the Applicant utilized FY19 for its long term projections in Table 10. Table 11 reflects a 3% annual growth of scans with the exception of the Breast Cancer Program, which has been experiencing much higher year-over-year growth as is shown in Table 12 below.

Table 11: Year One Projected New Volume by Volume Source

Source of New MRI Volume	**Projected # New Scans[+]**
Patients who would previously have been referred elsewhere for 3T MRI	1,558
Patients who would previously have been transferred elsewhere for MRI scans	196
Breast Cancer Program	1,622
Aging Population	199
Additional services to meet the needs of the Applicant's patient population, including but not limited to Prostate imaging, neuro imaging, perfusion brain tumor imaging, seizure imaging, inflammatory arthropathies, small joint MRI, improved pediatric imaging, MR Enterography, and acute abdomen MRI.	720
Increase in the number of patients served as a result of decreased inpatient and Emergency patient wait times for MRI leading to reductions in overall length of stay.	1,182
Total projected new scans (both 1.5T and 3T)	**5,477**
2019 Historical Volume[++]	**7,471**
Total Year 1 Projected Volume	**12,948**

[+]Projected Scan volumes are based on FY 20 data

[++]19 Historical Volume data was not impacted by COVID-19 and is a better representation of historical trends to use in projecting future volume.

The Applicant attributes the projected increase in MRI scan volume at SSH main campus to the following sources:

- **Scans previously referred or transferred to other facilities:** As mentioned above, 1,512 patients were referred outside SSHS for 3T MRI scans in FY20 and 190 patients were transferred to SSH off-campus facilities for a total of 1,702 MRI scans in CY20. The Applicant expects that the addition of the more advanced 3T MRI will eliminate the need to transfer patients and reduce referral of patients outside of SSHS for MRI scans. With growth, the Applicant anticipates an additional 1,754 scans from this source.
- **Breast cancer scans:** SSH experienced growth in its breast cancer program at the Cancer Center. The Applicant states the Breast Cancer Center provides consultations for benign breast conditions, screening and diagnostic imaging including MRI and breast biopsy, high-risk and genetic counseling services, and comprehensive treatment of breast cancer.[11] Table 12 below shows a 54% increase in breast MRI scans and a 294% increase in breast biopsies over the past four years. The Applicant states that SSHS expects this trend to continue, leading to increasing demand for MRI services at the main campus.

Table 12: Breast Care MRI Volume at the Cancer Center

	2017	**2018**	**2019**	**2020**
Breast MRI	630	731	996	971
Breast Biopsy MRI	18	33	56	71
Total	**648**	**764**	**1052**	**1042**

- **Population growth:** SSH considered population growth a primary factor in calculating scan volume projections at SSH main campus. Citing population projections from UMass Donahue Institute, the Applicant projects that the increasing age 65+ age cohort – which will represent 24% of the population in Southeastern Massachusetts by 2035 and 42.7% of SSHS existing MRI patients – will result in increasing demand for MRI services among the Patient Panel. The Applicant asserts that a growing and aging population will have an increased need for high-quality imaging services to diagnose and treat age-related conditions. The Applicant asserts that the addition of services and program growth to meet the needs of its patients were factored into the projections.
- **Additional services**: New services that will contribute to projected scan volume include prostate imaging, neuro imaging, perfusion brain tumor imaging, seizure imaging, inflammatory arthropathies, small joint MRI, improved pediatric imaging, MR Enterography, and acute abdomen MRI.
- **Increased efficiency**: The Applicant asserts that through the Proposed Project, SSH MRI services will be able to operate more efficiently and effectively, and this will increase the number of patients served. As mentioned in Factor 1, delays in obtaining imaging can increase length of stay for inpatients and Emergency patients. The Applicant states that

[11] The Breast Cancer Center is affiliated with Brigham and Women's and Dana-Farber Cancer Institute, and is comprised of specialists including Brigham and Women's breast surgeons, medical and radiation oncologists from Dana-Farber Cancer Institute, and South Shore Hospital's radiologists and pathologists, non-physician experts including nurses, a dietician, oncology social workers, and experts in integrative therapies. A Breast Imaging Navigator coordinates care with the multidisciplinary team. All patients seen at the Center have access to the services.

an increase in MRI capacity at SSH will decrease inpatient and Emergency patient wait times, which will lead to reductions in overall length of stay, and an increase in the number of patients served.

- **Wait Times**: The Applicant states that SSH used data from its health information system (HIS) to project MRI volume at SSH main campus after implementation of the Proposed Project. Table 13 below demonstrates that the existing MRI at SSH main campus has been operating above capacity for the past four years based on the operating capacity described above in Table 5.

Table 13: MRI Volume at SSH Main Campus

Year	2017	2018	2019	2020
# of Scans	7,284	7,497	7,471	6,497

MRI wait times for inpatients and emergency patients at SSH have increased during the same period that operating capacity has increased. In FY20 wait times at the main campus were 13 hours for emergency patients and 24 hours for admitted patients. With implementation of the Proposed Project, the Applicant projects a measurable reduction in wait times for inpatients and outpatients as shown in Table 14 below.

Table 14: Projected MRI Wait Times Following Implementation (Hours Order to Exam)

	Year 1	Year 2	Year 3
Admitted Patients	14	12	8
Emergency and Observations	8	6	6

Analysis

Staff concurs there is demonstrated need to increase Patient Panel access to MRI services to reduce transfers of inpatient and emergency patients, admission length of stay, wait times, and referrals outside of SSH to obtain 3T MR imaging. Further, the addition of a 3T MRI unit will help meet projected increasing demand for MRI services. While interfacility transfers can be necessary for diagnostic and therapeutic interventions, and to maintain coordination and continuation of care, they can also pose a risk to patient safety including the potential for clinical deterioration.[a] Longer hospital lengths of stay have been related to delays in imaging time for MRI,[b] and longer inpatient stay can impact patient flow through the hospital, including ED boarding.[c] Increasing wait days[12] for outpatient MRI imaging appointments have been shown to increase likelihood of missed appointments for MRI[13], and this effect was shown to be

[12] Wait day is the number of days between the date an examination was ordered or requested within the computerized order entry system and the date the examination was performed or scheduled to be performed.
[13] The article lists possible reasons for the relationship between missed appointments and increased wait days: patients' forgetting appointments, decreased patient control over future schedule conflicts, patients' perception that scans scheduled for long intervals might not be as important, resolution of the symptoms prompting the

modified by race and insurance payer.[d,14] Increasing access and capacity to provide MRI services may help to improve equitable access to such services. The addition of a 3T MRI unit will reduce the reliance on patient transfers to access MRI imaging and enhance patient safety. Higher strength MRI machines require less scanning time to produce higher quality images allowing for prompt scanning of more patients and a reduction in wait times. In addition, reducing time to diagnosis and treatment has the potential to improve patient outcomes and quality of life. In order to understand Patient Panel access to MRI services, the Applicant will report annually on the following: utilization of MRI at SSH, the site of the Proposed Project, and stratify data by age, race/ethnicity and payer mix; the number of transfers from SSH to SSHS outpatient facilities for MR imaging; and the number of patient referrals to facilities outside of SSHS for 3T MR imaging. The measures are described below in Appendix 1.

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

The Applicant states that MRI is a well-established, non-invasive imaging modality that is used to visualize internal and anatomical structures without the use of ionizing radiation. MRI is used in disease detection, diagnosis, and treatment monitoring. MRI machines used for diagnosis and treatment commonly have a magnetic field strength of 1.5T or 3T, and the stronger magnet improves image quality allowing for visualization of anatomical features in greater detail. Higher field strength also requires less scanning time to produce high quality images allowing for an improved patient experience.

A 1.5T MRI is useful for most routine scans and produces high quality images for diagnosis and is safer for patients with medical implants. The Applicant states the advantages of a 3T MRI include[e]

- Efficiency leading to shorter examination times which improve patient experience
- More detailed images which are useful in diagnosing pathological conditions involving the brain, spine, and musculoskeletal conditions
- More sophisticated imaging producing more accurate diagnosis
- Lower risk of distorted imaging reducing the need for repeat exams

Improved imaging capabilities of a 3T MRI machine allow for improved disease detection and diagnosis and a reduction in unnecessary treatment. With 3T MRI, higher resolution images are obtained in a shorter period of time which can improve safety for some patients, such as NICU

imaging studies, patients' undergoing sooner imaging or workup at alternative sites or as inpatients, and anxiety or anticipation of positive results from imaging. Possible reasons for this association that may be amplified in minority population include disparities in health literacy, and perceived disrespect or mistrust of the health care system.
[14] When stratified by race, black or African American, Hispanic, and Asian race had increased missed appointment rates compared with their white counterparts. When stratified by insurance, patients with Medicaid had increased missed appointment rates compared with patients with Medicare or commercial insurance.

patients, and is useful for younger patients that may not be able to remain still for long periods of time.

The Applicant further described the clinical applications of 3T MRI which include 1) Detecting brain damage in premature infants 2) Diagnosing pathological conditions involving the brain, spine, and musculoskeletal system, and 3) Cancer related uses (particularly breast and prostate cancer) including diagnosis, and staging and treatment planning.

- **Neonates and pediatric patients:** Neuroimaging of the preterm infant is used to initiate interventions and plan for supportive care, and assess the risk of future neurologic impairment.[f] MRI is valuable for detecting brain damage in premature infants. MRI scans identify the presence of extent of brain injury in preterm infants providing detailed imaging of the preterm infant brain without the use of ionizing radiation. MRI allows for differentiation of structures within the immature brain and shows the well-recognized pathologies seen on ultrasound allowing for the detection of more subtle abnormalities. Neuroimaging of the preterm infant is commonly performed in the NICU.[g] South Shore Hospital has the first and only Level III Neonatal Intensive Care Unit (NICU) located in a community hospital in Massachusetts.[15,h]
- **Brain and musculoskeletal imaging:** MRI technology is used to diagnose pathological conditions involving the brain, spine, and musculoskeletal system. Imaging remains a powerful noninvasive tool to positively impact the management of patients with brain tumor. MRI is being applied to diagnose and grade brain tumors preoperatively, to plan and navigate surgery intra-operatively, to monitor and assess treatment response and patient prognosis, and to understand the effects of treatment on the patients' brain.
- **Oncology:** MRI is an important tool in cancer detection and diagnosis, determine spread and staging and assisting in treatment planning. [i] Prostate cancer is the 6th leading cancer in the United states, the second most commonly diagnosed cancer, and the second leading cause of cancer death among men in the United States.[j,k] MRI provides visualization of prostate cancer, which can be used to guide biopsies that help plan treatments, and stage and monitor tumors. Additionally, highly accurate scans can impact treatment plans, potentially reducing the need for treatments that may have harsh side effects.[l] Breast MRI is used to screen for breast cancer for women at high risk, and to help determine the extent of breast cancer for women who have already been diagnosed, and for monitoring after treatment.[m]

The Applicant states that SSHS utilizes Change Healthcare Care Select Decision Support Software for all orders placed by a clinician within SSHS' health information system (HIS). The software assesses the medical necessity of the exam and provides feedback to the clinician, including whether the MRI is recommended, and if alternate imaging is recommended, given the clinical information. The Applicant asserts that the software has been effective in reducing unnecessary MRI exams: in 2020, SSHS decision support software was consulted 5,842 times and resulted in 83 instances of an alternate order being placed (CT, MR, Nuclear Med, and

[15] The NICU is staffed by doctors, nurses, and respiratory therapists with specific training in the care of ill, premature, and recovery newborns with 24/7 in-hospital coverage by a neonatologist and a neonatal nurse practitioner.

select X-rays). The Applicant states also that SSHS follows the requirements of insurance providers to determine if prior authorization is required (non-emergent MRI appointments are not provided unless preauthorized by the patient's insurance provider). The Applicant notes that the number of MRI exams not pre-authorized by a patient's insurance provider is not individually tracked.[16]

Analysis

- **Improved Outcomes:** MRI can improve quality of life by providing more accurate information to facilitate appropriate treatment and reduce unnecessary treatment.
- **Reduced wait times for imaging:** Improved access to MRI can allow for prompt scanning of more patients; reducing delays in diagnosis and treatment can improve health outcomes and quality of life.
- **Improved patient experience:** Reducing scan times can provide comfort to patients and improve patient experience and satisfaction. Earlier diagnosis and treatment can reduce time lost from work, family, and other activities, and as a result, patients may experience a greater sense of well-being.

Appropriate use is particularly relevant for imaging technology. The *Choosing Wisely* Campaign of the American Board of Internal Medicine Foundation[n] lists some MRI procedures whose "necessity should be questioned and discussed" by physicians and their patients. The Massachusetts Health Policy Commission (HPC) has noted that overuse of some MRI imaging and their related costs remain a concern in the Commonwealth.[o] While ensuring access to imaging technology can improve patient satisfaction and a sense of wellbeing, inappropriate use can lead not only to higher costs, but also to lower quality care and increased worry as a result of unnecessary healthcare interventions from false positive scans.[p] The Applicant described the clinical utility of 3T and clinical decision systems in place to support appropriate use of MRI imaging. The Applicant has provided several measures, including wait times to appointments and quality of care, which may indicate improved outcomes. Staff reviewed the suggested measures that will become part of the annual reporting to DPH. The measures are described in Appendix 1 below.

Health Equity and Social Determinants of Health (SDoH)

The Applicant provided the following examples of SSHS efforts to achieve health equity across all populations.

Nondiscrimination

The Applicant asserts that SSHS does not discriminate on the ability to pay or payer source and will apply this policy to all services provided through the Proposed Project. SSH has been deemed a Certified Application Counselor Organization. Through this designation, the Hospital

[16] The Applicant states that there are MRI orders where the insurance carrier denies the approval and the exam is not performed or alternative imaging is ordered by the clinician, and notes that if a patient wishes to proceed with an MRI exam without prior authorization, the patient is personally responsible for the cost of the exam.

certifies personnel as Certified Application Counselors to assist patients with enrollment in MassHealth, some Health Connectors programs, the Health Safety Net, the Children's Medical Security Program, Medical Hardship, and SSH's Financial Assistance Program.

Culturally Competent Care
The Applicant states that all clinical and non-clinical staff are provided with cultural and linguistic education upon hire and annually thereafter. SSH provides professional medical interpreters through face-to-face, telephonic, and video conference modalities. The Applicant provides medical interpreters in-person through Benoit interpreters, through video conferencing, and a 3-way phone call provided by Cyracom Interpreter Services. Interpreter services are provided for Deaf and Hard of Hearing patients, including American Sign Language translators and Certified Deaf Interpreters. In addition, all written materials and forms are professionally translated. The Applicant asserts that the same access for interpreter services is available for SSHS MRI patients regardless of scanning location.

Population Health Initiatives to Promote Health Equity[17]
SDoH Screening for Medicaid ACO Patients – The Applicant states that Medicaid ACO Boston Accountable Care Organization (BACO) member patients are screened for SDoH through use of the Tool for Health and Resilience in Vulnerable Environments (THRIVE) screener. Patients are screened as part of their annual physical visit or new patient appointment. Patients engaged in one of SSHS' Care Management Programs (Transitional Care, Complex Care, Advanced Illness Care, or within a preferred skilled nursing facility (SNF) network), can be assessed for SDoH considerations/needs at any point in the development of their overall care plan.

Through THRIVE screening, patients are asked about their living situation, access to food and ability to pay, transportation, and education and responses are documented in the EMR. THRIVE screening can be completed on a handheld tablet while the patient waits for their visit, via MyChart access on their own personal device up to three days prior to a scheduled appointment, and with a paper tool, the results of which are manually entered into the electronic medical record (EMR), Epic, by SSHS staff. The Applicant notes that THRIVE screening can also be conducted with assistance via verbally prompted questions, telephonically, or virtually by the patient's care team, noting the results are entered into the EMR.

Referrals for positive SDoH screens are initiated in Epic where they are accessible to the Population Health Team. The Applicant states that referrals can be made directly to Case Management and Social Work for further intervention. After social work intervention, a repeat THRIVE screening can be done as appropriate in follow-up. A Community Resources Directory can be accessed through SSHS's webpage allowing access to programs based on location and eligibility. Any member of a patient's care team can access the Community Resource Directory within SSHS from any point in the system (ambulatory, hospital, and community) and perform a search on a patient's behalf. A resource list can be printed or emailed to a patient or patient's

[17] Detailed descriptions can be found in Reponses to DoN Questions. https://www.mass.gov/lists/don-south-shore-health-system-inc-21040109-hs

representative. The After Visit Summary (AVS) built into the EMR has a specific list of resources and the Applicant states that a list of resources will print out on the AVS when prompted by positive indicators in the THRIVE screening tool. Non-ACO patients are screened for SDoH across SSHS of care at various access points, using various assessments.

The Applicant states that through screening with the THRIVE tool, patients are identified for participation in several programs to address identified SDoH needs.

- **Flexible Service Program**:[18] Positive SDoH screens for food insecurity are reviewed for eligibility to participate in the Flexible Services Program. The Program started in February 2020 and works in partnership with local social service organizations to deliver nutritious food to a large area of the South Shore. Patients receive a follow-up phone call from the Social Worker after 12 weeks to screen for improvement of food insecurity and behavioral health status.
- **Experience of Violence**: SSHS brough in a representative from DOVE, Inc. (Domestic Violence Ended) to educate providers on having conversations with patients related to domestic violence.[19] The Applicant states that multiple notices about domestic violence resources are made available including the SSH Blog, South Shore Medical Center Newsletter and posters in all primary care exam rooms and bathrooms.
- **The Mobile Integrated Health (MIH) Program**:[20] This program, launched in March 2020, dispatches paramedics to patient homes to provide care under the direct supervision of a physician Medical Director. MIH has two programs: the SNF-at Home and Basic. The Applicant notes that Basic MIH services is a frequent touch point and medical care for high utilizing patients or patients with chronic health conditions. Basic MIH services help to manage patients in the community, which in turn creates capacity within the health care system and emergency services. The MIH Program is payer-agnostic and is dependent on skilled need and service area. MIH paramedics provide clinical interventions that include telehealth with providers, labs, IV treatments, and mobile imaging service to avoid need for unnecessary ED visits or inpatient hospitalization. The Applicant states that all patients are eligible for the MIH program through referral from MD Practices, care progression, and South Shore Visiting Nurse Association (VNA) regardless of their ability to pay. The team actively completes SDoH screening with patients via the THRIVE tool. Both the SNF and Basic Programs currently service the following cities and towns: Abington, Braintree, Cohasset, Duxbury, Hanover, Hingham,

[18] Under the Flexible Services Program (FSP), the State will provide eligible MassHealth members with access to Flexible Services, which consist of Tenancy Preservation Services (TPS) and Nutritional Support Services (NSS). https://www.medicaid.gov/medicaid/section-1115-demonstrations/downloads/ma-masshealth-appvd-flex-services-protocol-05112020.pdf

[19] DOVE, Inc. (Domestic Violence Ended), DOVE is a 501(c)3 charitable non-profit organization and legal advocacy program that provides community-based services and outreach programs for individuals impacted by domestic or partner violence.

[20] South Shore Hospital Launches SNF-at-Home Program. https://www.hcinnovationgroup.com/population-health-management/remote-patient-monitoring-rpm/news/21217217/south-shore-hospital-launches-snfathome-program

Hull, Holbrook, Kingston, Marshfield, Norwell, Quincy, Pembroke, Plymouth, Randolph, Rockland, Scituate, Whitman, and Weymouth.

Additional Community-based Health Equity Initiatives include:

- The *Brazilian Community Health Project* started six years ago and partners with Jewish Vocational Services (JVS), to meet the language needs of other non-English speaking/early adopters of the English language.
- For the past three years SSHS worked as a convener bringing the community together to address homelessness and housing insecurity. Examples include SSHS working with Father Bill's homeless shelter to create a private area in the shelter for SSH's Mobile Integrated Health to use when it is on site, and SSHS's work with Manet Community Health Center to assist in fill gaps for mobile care to homeless encampments and other homeless members of the community.
- SSHS provides outreach and education to build resiliency in youth through *Youth Health Connection*, providing tools for suicide prevention, at risk behaviors, bullying and to meet the needs of the LGBTQ youth community.
- SSHS connected with the Aging Services Access Points (ASAP)[21] and other organizations to reach seniors to impact mental health, social engagement, and support, through use of technology and outreach to address social isolation and the reduction in preventable health care among older populations that occurred during the COVID-19 pandemic.

Analysis: Health Equity and SDoH

Staff finds that SSHS' planned language access services are appropriate for patients receiving MRI scans. Further, the Applicant has described population health and community-based health equity initiatives that screen for and work to address SDoH issues identified among the Patient Panel. The Applicant has appropriately outlined at a high level a case for improved health outcomes and has provided reasonable assurances of health equity within SSHS for MRI patients.

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

The Application states increasing the number and type of imaging appointments available will help to keep patients within SSHS, which is necessary for optimizing care coordination and reducing fragmented care.

1. **Integrated medical record:** The Applicant states that patients will receive all of their imaging services within one system ensuring continuity of care through the shared

[21] ASAP's are private non-profit agencies with governing boards that serve and represent 51% of people aged 60 and older.

electronic health record (EHR) system. This EHR supported continuity enables imaging results to be available to primary and specialty physicians across the system and includes capabilities to facilitate clinical decision support, peer review, and monitoring.

2. **Care coordination:** Patient transfers from SSH to any other imaging location within SSHS for an MRI scan are coordinated by the SSHS MRI department, the clinician taking care of the patient, and Emergency Medical Services (EMS). The Applicant states that all imaging is stored electronically in SSH picture archiving and communication system (PACS) and is accessible from the patient's chart. The Radiology Department and the clinician taking care of the patient coordinate patient referrals from SSH to a non-SSHS for facility for MR imaging and the transfer and receipt of imaging and reports. Images acquired at a facility outside of SSHS are obtained by SSHS via a CD containing the imaging result and the images and reports are uploaded into the patient's SSHS chart. SSHS has the ability to send images and reports electronically via CD to a facility outside of SSHS that needs prior imaging performed at SSHS for comparison purposes. The Applicant notes that in some circumstances, inpatients are transported to an outside facility for imaging yet remain an admitted patient at SSH. The process is coordinated by the Radiology Department, the patient's care team, and EMS, and the Radiology Department coordinates the receipt of all imaging performed by the outside facility.
3. **Case management:** The Applicant states that SSHS will promote continuity of care and improved health outcomes and quality of life through linking imaging patients with case management/social work to ensure patients have access to resources around SDoH issues. Further, the Applicant asserts that facilitating provider and community linkages for the Patient Panel furthers care management and improved health outcomes for the Patient Panel.

Analysis

Staff concurs that when MRI capacity is increased and the provision of MRI services is more efficient, delays in diagnosis and treatment can be reduced. Studies show that integrated health information technology systems directly affect health outcomes, as access to a single, integrated health record improves care coordination, can reduce errors, improve patient safety, and support better patient outcomes.[q] Generally, EHR systems enable imaging results and information to be available to primary care and specialty physicians across a system. Utilization of an EHR tool saves time and resources by improving communications, care coordination and efficiencies among providers.

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 through the Patient Panel

The Department's Guideline[22] 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."[23]

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

1. **Presentation to South Shore Hospital's Patient and Family's Advisory Council (PFAC) on June 25, 2020.** Twenty members were in attendance including, 12 SSH staff and eight community members. The PFAC is comprised of current and former SSHS patients, family members, committed volunteers, and SSH staff. The Applicant states the role of the PFAC is to "bring the voice of patients and families to SSH's decision-making by creating a structured forum and process for SSH to learn from patients, families, and community members." The PFAC has 10 community members and two organization members. The Applicant states that the PFAC includes six women and four men; 70% of community members are retired; 30% are employed; and the Council is predominantly middle class, and Caucasian. A presentation providing an overview of the Proposed Project was made to the PFAC members, the purpose and benefits of the Proposed Project were discussed, and feedback from PFAC was favorable.
2. **Community Forum for Community Members on March 18, 2021.** A community meeting was held using remote technology. Fifteen people were in attendance, including 13 SSH staff and two community members. SSH leadership presented an overview of the Proposed Project, and the purpose and benefits of the Proposed Project were discussed with those in attendance.

The Applicant provided the slides that were presented at the meetings.

Analysis

Staff finds that the Applicant met the minimum required community engagement standard of Consult in the planning phase of the Proposed Project.

Factor 1: f) Competition On Price, Total Medical Expenses (TME), Costs And Other Measures Of Health Care Spending

The Applicant asserts that the Proposed Project will expand access to services at SSH without a net increase in TME because the addition of a second MRI unit at SSH will:

[22] Community Engagement Standards for Community Health Planning Guideline

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

1. Reduce overall wait times. As mentioned above in Factor 1a Patient Panel need, average wait time is 24 hours for inpatients, and delayed imaging can increase length of stay of inpatient admissions, which increases cost of care.
2. Reduce patient transfers to off campus MRI units. Patient transport to receive imaging increases the cost of care. The Applicant states that during CY20, SSHS transferred 190 patients to alternate SSHS imaging facilities at a cost of $350 per trip. Total costs incurred for transfers in FY20 was $66,500.

The Applicant states also that MRI services are not reimbursed differently depending on machine strength: 1.5 and 3T MRI are reimbursed the same and so reimbursement rates will not change because of the Proposed Project.

Analysis

It has been documented that improving access to timely care is likely to reduce healthcare utilization and spending.[r] The Applicant has demonstrated how increasing access to MRI services for the Patient Panel will reduce patient transfers and associated costs, with little material impact on healthcare spending. Additionally, the Applicant has described how existing clinical decision support (CDS) tools in place will be applied to the Proposed Project to support appropriate use of imaging and minimize overuse.

Proposed Reporting Measures for FACTOR 1

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). 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, in addition to the measures suggested above by staff. The measures are described below in Appendix 1. Reporting must include a description of numerators and denominators, where applicable.

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

Cost Containment

The Applicant discussed how the Proposed Project will align with the Commonwealth's goal for cost containment, as well as contribute to improved public health outcomes. As discussed above, the addition of an MRI unit will reduce delays and inefficiencies in the provision of MRI services that can lead to higher healthcare costs, including

- Cost to transfer patients to access MR imaging; and
- Increasing costs associated with delayed diagnosis and treatment.

Analysis: Cost Containment

Staff finds that the Applicant has adequately explained how the Proposed Project aligns with the Commonwealth's cost containment goals through increasing access to high-quality, cost-effective imaging and implementation of CDS tools to minimize overuse, which contributes to increased healthcare costs.

Improved Public Health Outcomes

The Applicant asserts that the Proposed Project will improve public health outcomes by providing SSHS patients timely access to high-quality MRI services resulting in more efficient services and a reduction of wait times. The Applicant notes that demand for MRI services will increase as the population ages and risk for age-related conditions that can be diagnosed and treated with MRI increases.

Analysis: Public Health Outcomes

As detailed throughout this report, improvements in patient health outcomes result from efficient and timely access to MRI services and well as appropriate use of MRI. Yet, studies show that race, age, and socioeconomic status are factors associated with variation in access to and utilization of diagnostic imaging. This includes disparities in breast[24] and prostate cancer screening utilization by race, ethnicity, and socioeconomic status (SES), a lack of guideline-consistent use of MRI that can exacerbate existing disparities[s,t,u,v]; and differing use of MRI and CT among adult ED patients.[w] As mentioned above, the Applicant will also report on utilization of MRI services at SSH by age, race/ethnicity, and payer mix.

Delivery System Transformation

As noted above, the Applicant described screening of MassHealth patients for SDoH needs, as well as the referral process and linkage to community-based social services and resources. The Applicant states it serves ~ 8,000 South Shore Health System patients that are members in the BACO MassHealth ACO Program. The Applicant notes that its BACO-enrolled population increased from 5,000 when the program first started to the current enrollment of 8,000.

Analysis: Delivery System Transformation

Central to the goal of Delivery System Transformation is the integration of social services and community-based expertise. The Applicant has described how residents in the panel are assessed and how linkages to social services organizations are created. The Applicant further described additional SSHS initiatives to identify and address SDoH needs identified among the Patient Panel.

[24] The article states further work should examine potential causes of the observed disparities which may include patient preference, provider-level variation in recommending and ordering screening MRI, patient-provider communication, or financial barriers to care.

SUMMARY for FACTOR 2

As a result of information provided by the Applicant, additional analysis and annual reporting measures that include reporting on MRI utilization by race/ethnicity, 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: Demonstration of Sufficient Funds as Supported by an Independent CPA Analysis

Under Factor 4, the Applicant must demonstrate that it has sufficient funds available for capital and operating costs necessary to support the Proposed Project without negative effects or consequences to the existing Patient Panel. Documentation sufficient to make such finding must be supported by an analysis by an independent CPA. The CPA examined a range of documents and information in developing its report including a five-year financial forecast (Projections) for fiscal years ending 2022 through 2026, projected income statements for the Proposed Project, Audited Financial Statements of South Shore Health System, Inc. (South Shore Health), South Shore Health website, and a Presentation to Leadership on the Proposed Project. Additionally, it calculated key liquidity and operating metrics to assist in determining reasonableness of the Applicant's assumptions and feasibility of the Projections.

Revenues

The CPA analyzed net patient service revenue, the only category on which the Proposed Project would have an impact, identified by South Shore Health in both projected and financial information. The CPA states that the incremental revenue from the Proposed Project represents approximately .370% (less than 4 tenths of 1%) of South Shore Health operating revenue in FY2022 and approximately .383% (less than 4 tenths of 1%) of South Shore Health operating revenue in FY 2026.[25] Based upon its review, the CPA determined the Applicant's projected revenue growth is reasonable.

Operating Expenses

The CPA reviewed the operating results for South Shore Health for the years ended 2019 and 2020 to determine the impact of the Proposed Project on the consolidated entity and to determine the reasonableness of the Projections for FY2022 through 2026. The CPA determined that the Proposed Project would represent approximately .199% (less than two tenths of 1%) of South Shore Health operating expenses in FY2022 and approximately .195% (less than 2 tenths

[25] The first year in which revenue and operating expenses are present for the Proposed Project is FY2022.

of 1%) of South Shore Health operating expenses in FY2026. Based on their review, the CPA found the operating expenses estimated by the Applicant to be reasonable.

Capital Expenditures and Cash Flows
The CPA reviewed current and projected capital projects and loan financing obligations included in the Projections and impact of projected expenditures on South Shore Health cash flow and determined that the pro-forma capital expenditures and resulting impact on South Shore Health cash flows are reasonable.

CPA's Conclusion of Feasibility
The CPA determined that because the Proposed Project represents a relatively insignificant component of the projected operating revenue and expense of South Shore Health, the Projections are not likely to result in insufficient funds available for capital and ongoing operating costs necessary to support the Proposed Project and the continued operating surplus are reasonable and based on feasible financial assumptions. Thus, the Proposed Project is feasible and within the financial capability of SSHS, and not likely to have a negative impact on the Patient Panel.

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

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

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

1. **Acquire a mobile MRI unit.** The Applicant rejected this alternative because the distance required to transport patients from the ED or their room to the MRI trailer would negatively impact patient experience; the location of the mobile trailer would create access issues for the Hospital's Code team in the event of an emergency; and because the space in the mobile trailer is smaller than that in an MRI scan room which limits the number of supplies and patient comfort items that can be made available. The Applicant determined this alternative was less efficient because it would require the operation of two separate MRI areas.

2. **Maintain the status quo of the existing MRI units.** The Applicant rejected this option because quality of care and access to care would continue to be reduced and wait times and delays would continue to increase as demand for quality MRI services increases with patient volumes. This alternative would not eliminate the need to refer patients outside of the SSHS for 3T MRI services. Operating costs would continue to increase as SSH continued to transport admitted and emergency department patients to its satellites for MR imaging.

The Applicant states that SSH plans to replace the existing 17-year-old 1.5T MRI unit with a new 1.5T machine concurrent with the addition of a 3T machine.

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

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

Summary and relevant background and context for this application: The Applicant is applying for a DoN that will result in a Tier 1 Community Health Initiative (CHI) project for South Shore Hospital in Weymouth, Massachusetts. The Applicant Hospital serves the thirty-three towns that constitute the state's South Shore region, and the Needs Assessment and Planning cover the full region, while the CHI activity will serve those deemed priority areas. The Applicant's proposed project is its first CHI that will be implemented under the CHI Guidelines approved in 2017.

To fulfill Factor 6, the Applicant submitted its most recent Community Health Needs Assessment (CHNA) and Implementation Strategy, a Self-Assessment, Stakeholder Assessments, and a CHI Narrative.

The Community Health Needs Assessment was conducted in phases starting in 2018 by South Shore Health System (South Shore Hospital will implement the CHI activities). The final Community Health Needs Assessment utilized quantitative secondary data and primary data gathered from interviews, community forums, focus groups, a community survey, and a Community Health Strategic Retreat. The CHNA describes quantitative and qualitative data collection methods and outlines demographic characteristics of the participating communities as well as key themes across community health areas and priority populations. The health priorities include Behavioral Health/Substance Use Disorder and Chronic and Complex Conditions and their Risk Factors, while the populations of focus include Youth and Adolescents, Older Adults, and Low to Moderate Income Individuals. The CHNA also informs the health system's Implementation Strategy across the five Priority Populations and four Community Health Priorities outlined in the Needs Assessment.

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, community surveying, focus groups, forums, key informant interviews and a retreat, the participating community groups and residents identified the key concerns and populations outlined in the 2019 CHNA.

Stakeholder Assessments submitted provided information on the individuals' engagement levels including their level of 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 largely consistent with the self-assessment conducted by the Applicant.

The CHI Narrative provided background and overview information for the CHI processes. The narrative also outlines advisory 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 CHI activities.

There are differences in approach and alignment between the Applicant's existing Implementation Strategy and Assessment, and the CHI framework. If used as a guide for choosing CHI strategies, the activities outlined in the Implementation Strategy will need to focus in the areas best aligned with the CHI framework to sufficiently meet Health Priority guideline approaches. The Implementation Strategy areas most closely aligned with that framework are within the Social Determinants of Health priority. The Applicant will need to continue to work closely with its large and robust Advisory Committee to ensure processes and selected strategies will align with the Health Priorities Guideline. DPH will work with the Applicant to ensure Advisory Committee's make up is sufficient to help them make decisions in line with Health Priority principles. Specifically, DPH will work with the Applicant to ensure resident voice is engaged in decision making through the Advisory Committee. DPH staff will support the Applicant as necessary in outlining future Advisory Committee meetings and reviewing community engagement and RFP processes. The Applicant will also connect with DPH staff to establish processes for planning and implementation work moving forward. Regarding the implementation of specific CHI strategies, DPH will work with the Applicant in moving upstream, and identifying needs at the root cause to support sustainable systems level solutions.

The timeline, RFP processes, and use of evaluation and administrative funds are all appropriate and in line with CHI planning guidelines.

The anticipated timeline for CHI activities includes the first meeting of the Advisory Committee six weeks post approval, identifying the Health Priorities Strategies 3 months post approval, and releasing an RFP six months post approval, with funding awarded to successful RFP applicants 3-4 months thereafter.

With the administrative funds, the applicant's early plans are to support consultant time, and the development and dissemination of community communication materials, particularly about the RFP process.

Summary Analysis: As a result of information provided by the Applicant and additional analysis, staff find that with the conditions outlined below, and with their ongoing commitment to work with staff on the above outlined issues, the Applicant will have 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 Department approve this Determination of Need, subject to all applicable standard and Other Conditions.

In compliance with the provisions of 105 CMR 100.310(A)(12) and (17), which require a Holder to report to the Department, at a minimum on an annual basis, including the measures related to the project's achievement of the DoN factors, for a period of five years from completion of the Project, the Holder shall address ongoing evaluation of access and quality measures described below in Appendix 1.

Conditions to the DoN

1. Of the total required CHI contribution of $119,374.05
    a. $11,459.91 will be directed to the CHI Statewide Initiative
    b. $103,139.18 will be dedicated to local approaches to the DoN Health Priorities
    c. $4,774.96 will be designated as the administrative fee.
2. To comply with the Holder's obligation to contribute to the Statewide CHI Initiative, the Holder must submit a check for $11,459.91 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.

Appendix 1

The Holder shall provide, in its annual report to the Department, the following outcome measures. These metrics will become part of the annual reporting on the approved DoN, required pursuant to 105 CMR 100.310(A)(12).

1. **Patient Experience/Satisfaction**: Patients that are satisfied with care are more likely to seek additional treatment when necessary. SSH staff will review overall ratings of care with imaging services via a Press Ganey survey.

   Measure: Overall rating of care using response options: Very poor, poor, fair, good, very good

   Projections: SSHS will provide baseline measures and three years of projections following one full year of operation from the date of implementation of the Proposed Project.

   Monitoring: Results will be benchmarked and reviewed quarterly by the Radiology Department.

2. **Access - Wait Times**: The Proposed Project seeks to ensure timely access to MRI services. SSH will track the time interval (in hours) from when the case was initiated for scheduling to appointment. This information will be obtained via the electronic medical record system, Epic.

   Measure: Time interval (in hours) from when the case was initiated for scheduling to appointment.

   Monitoring: Results will be benchmarked and reviewed quarterly by the Radiology Department.

   Projections - Admitted patients:

   Baseline: 24 hours Year 1: 14 hours
   Year 2: 12 hours
   Year 3: 8 hours

   Projections – Emergency and Observation:

   Baseline: 13 hours Year 1: 8 hours
   Year 2: 6 hours
   Year 3: 6 hours

3. **Quality of Care - Reporting of Critical Value Results:** SSH uses PowerScribe within EPIC to document radiology findings, including any follow-up actions required as a result of Critical or Significant findings. All Radiologists are expected to document Critical or Significant findings within the "Follow Up" tab in PowerScribe. Once an acuity of Critical or Significant is entered into the patient's medical record, a 72-hour timer is triggered for administrative staff to notify the patient's care team. If follow-up is not completed within 72-hours, an escalation alert is sent out to a specific pool of administrative imaging staff.

Measure: Number of radiologists conducting critical value reporting on cases being interpreted.

Projections: Baseline: 100%

Year 1: 100%

Year 2: 100%

Year 3: 100%

Monitoring: MRI scans will be forwarded to the patient's care team in order to complete follow-up as required. The radiologist will be available to answer any questions.

4. **Quality of Care - Quality of MRI Scan**: The quality of an MRI scan is imperative to its interpretation. Accordingly, the System will evaluate the number of scans that need to be repeated within a 48-hour period from the date of the original scan to ensure radiology technicians are performing appropriate scans.

   Measure: The number of repeat MRI scans performed on patients within a 48-hour period from the date of the original scan.

   Projections: Baseline: 5/month

   Year 1: 4/month (20% improvement)

   Year 2: 3/month (40% improvement)

   Year 3: 2/month (60% improvement)

   Monitoring: MRI technologists will track the number of scans that are repeated and scheduled for the next scan day. Technologists will document each case and conduct a monthly comparison to total volume to meet or exceed the metric.

5. The Applicant will report annually on the following:
   - Number of transfers from SSH to SSHS outpatient facilities for MR imaging,
   - Number of patient referrals to facilities outside of SSHS for 3T MR imaging.
   - Utilization of MRI at SSH stratified by age, race/ethnicity, and payer mix.

   Reporting will include a description of the numerators and denominators.

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