



Analysis of the Reasonableness of Assumptions Used For and Feasibility of Projected Financials of:

UMass Memorial Health, Inc.
For the Years Ending September 30, 2022
Through September 30, 2027



Tel: 617-422-0700
Fax: 617-422-0909
www.bdo.com

One International Place
Boston, MA 02110-1745

March 9, 2022

David Bierschied
Sr. Director of Strategic Planning
UMass Memorial Health, Inc.
306 Belmont Street
Worcester, MA 01605

**RE: Analysis of the Reasonableness of Assumptions and Projections Used to Support
the Financial Feasibility of the Proposed Project**

Dear Mr. Bierschied:

Enclosed is a copy of our report on the reasonableness of assumptions used for and feasibility of the financial projections for UMass Memorial Health, Inc. Please contact me to discuss this report once you have had an opportunity to review.

Sincerely,

BDO USA, LLP

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RE: Project Financial Feasibility Services Associated with DPH DON Factor 4

Dear Mr. Bierschied:

We have performed an analysis related to the reasonableness and feasibility of the financial projections (the "Projections") of UMass Memorial Health, Inc. ("UMass Memorial Health", "UMMH" or "the Applicant"), related to the proposed addition of one computed tomography ("CT") unit in the emergency department of the UMass Memorial Medical Center's University Campus at 55 Lake Avenue North, Worcester, MA. This report details our analysis and findings with regard to the reasonableness of assumptions used in the preparation of the Projections and feasibility of the projected financial results prepared by the management of UMMH ("Management"). This report is to be used by UMMH in connection with its Determination of Need ("DON") Application - Factor 4(a) and should not be distributed or relied upon for any other purpose.

I. EXECUTIVE SUMMARY

The scope of our review was limited to an analysis of the consolidated UMMH six-year financial projections for the Applicant for the fiscal years ending September 30, 2022, through 2027

prepared by Management and the supporting documentation to render an opinion as to the reasonableness of assumptions used in the preparation and feasibility of the Projections.

The Projections exhibit a cumulative operating EBITDA¹ surplus of approximately 5.2 percent of cumulative projected revenue of UMMH for the six years from FY 2022 through 2027. Based upon our review of the relevant documents and analysis of the Projections, we determined the anticipated operating EBITDA surplus is a reasonable expectation and based upon feasible financial assumptions. Accordingly, we determined that the Projections are reasonable and feasible, and not likely to have a negative impact on the Applicant's patient panel or result in a liquidation of UMMH's assets. A detailed explanation of the basis for our determination of reasonableness and feasibility is contained within this report.

II. RELEVANT BACKGROUND INFORMATION

The Applicant, UMass Memorial Health, Inc. is a Massachusetts nonprofit corporation and the largest health care system in Central Massachusetts. UMMH is comprised of one academic teaching hospital, UMass Memorial Medical Center ("UMMMC" or the "Hospital"), and three acute care hospitals: HealthAlliance-Clinton Hospital, Marlborough Hospital, and Harrington Hospital. The system includes behavioral health services through CommunityHealthlink, primary care, specialists, urgent care through CareWell Urgent Care, home health, and hospice. In addition, the Applicant has several joint ventures including (i) Hospital for Behavioral Medicine ("HBM"), a 120-bed mental health treatment facility in Worcester

¹ EBITDA ("Earnings before Depreciation, Interest and Tax")

County; (ii) The Surgery Center (“ASC”), an outpatient surgical facility in collaboration with Reliant Medical Group and Shields Health Care Group; and (iii) Pharmacy Ventures, which assists in developing and managing 340B programs for third parties as well as UMMH’s specialty drug program at the University campus.

UMMMC is the Applicant’s teaching hospital and includes three campuses: Hahnemann, Memorial, and University; the Psychiatric Treatment and Recovery Center (“PTRC”); and facility-based clinics in Uxbridge and Barre. The Hospital’s University Campus is the only Level 1 trauma center in Central Massachusetts and operates the second largest emergency department in Massachusetts. In addition to emergency care, the campus also provides comprehensive inpatient and outpatient services, including cardiology, oncology, and radiology.

The purpose of the Proposed Project is to expand capacity at the University campus to meet the needs of the Hospital’s current and future patients by improving its CT service and providing timely access. The Hospital has experienced significant patient panel growth and CT demand, as demonstrated by historical utilization data, because of its ability to quickly produce an accurate diagnosis, thus, allowing treatment to begin earlier. Currently, the Hospital is using the emergency department’s (“ED”) existing unit above capacity resulting in significant delays and suboptimal ED throughput. Given the over-utilization of the CT unit, it becomes more susceptible to problems requiring maintenance thereby resulting in down time for both patients and equipment. Patients must then be transported to a different department, adversely affecting patient experience and care. These factors, in addition to

longer protocols, can increase wait times and patients who remain in the ED for longer periods due to delays can experience deteriorating health resulting in avoidable admissions.

The Proposed Project seeks to improve health outcomes and patient satisfaction by alleviating the issues through timely CT imaging and improved throughput. The Proposed Project also aligns with Massachusetts' goal of cost containment by improving CT access and as a result, reducing ED overcrowding. UMMH has assured reimbursement rates for CT imaging will not change and therefore health care costs will not be adversely affected as a result of the additional CT unit.

III. SCOPE OF REPORT

The scope of this report is limited to an analysis of the six-year Projections for the fiscal years ending September 30, 2022, through 2027, prepared by Management, and the supporting documentation to render an opinion as to the reasonableness of assumptions used in the preparation and feasibility of the Projections. Reasonableness is defined within the context of this report as supportable and proper, given the underlying information. Feasibility is defined as based on the assumptions used, the Proposed Projects are not likely to result in a liquidation of the underlying assets or the need for reorganization.

This report is based on prospective financial information provided to us by Management. BDO understands the prospective financial information was developed as of December 21, 2021 and is still representative of Management's expectations as of the drafting of this report.

BDO has not audited or performed any other form of attestation services on the projected financial information related to the operations of UMMH.

If BDO had audited the underlying data, matters may have come to our attention that would have resulted in our using amounts that differ from those provided. Accordingly, we do not express an opinion or any other assurances on the underlying data or projections presented or relied upon in this report. We do not provide assurance on the achievability of the results forecasted by the Applicant because events and circumstances frequently do not occur as expected, and the achievement of the forecasted results is dependent on the actions, plans, and assumptions of Management. We reserve the right to update our analysis if in the event that we are provided with additional information.

IV. SOURCES OF INFORMATION UTILIZED

In formulating our conclusions contained in this report, we reviewed documents produced by Management as well as third party industry data sources. The documents and information upon which we relied are identified below or are otherwise referenced in this report:

1. Financial Model for UMMH for the periods ending September 30, 2022, through September 30, 2027;
2. Proposed fiscal year 2022 UMMH Budget Presentation to the UMMH Finance Committee on September 21, 2021, which also includes discussions regarding fiscal year 2021 performance;

3. Draft UMMH Application Form for DON Application;
4. Audited Financial Statements for UMass Memorial Healthcare, Inc. for Fiscal Years Ended September 30, 2021, 2020, and 2019;
5. Definitive Healthcare data; and
6. IBISWorld Industry Report, Hospitals in the US, dated November 2021.

V. REVIEW OF THE PROJECTIONS

This section of our report summarizes our review of the reasonableness of the assumptions used and feasibility of the Projections. Notably, Management indicated the Projections exclude the impact of inflation on both operating revenue and operating expenses after FY 2022. As such, the Projections consider only the impact of volume on both projected revenue (i.e., the number of patient days, discharges, cases/procedures, WRVUs, etc.) and operating expenses (i.e., the number of case/procedures, FTEs, etc.) for the remainder of the projected period (FY 2023 through FY 2027). Per discussions with Management, we understand that historically the impact of inflation has been similar for both operating revenue and operating expenses. We were not provided with, and therefore did not review, any historical information pertaining to the historical impact of inflation for either operating revenue or operating expenses and therefore relied on Management's assumption that the impact of inflation would be neutral (the impact of inflation on operating revenue and operating expenses would offset) from FY 2023 to FY 2027. Furthermore, we understand Management discussed this simplifying assumption with staff members from the Massachusetts Department of Public Health prior to preparing the Projections.



The following table presents the Key Metrics, as defined below, which compare the forecasted operating results of the performance of UMMH after the affiliation to market information from IBISWorld and Definitive Healthcare to assess the reasonableness of the Projections.

Key Financial Metrics and Ratios	Projected						IBIS - Hospitals in the US (2)	Definitive Healthcare
	2022	2023	2024	2025	2026	2027		
Post-Affiliation UMMHC Projection								
Profitability								
Operating Margin (%)	0.2%	0.3%	0.4%	0.4%	0.4%	0.5%	16.3%	-11.7%
Excess Margin (%)	1.1%	1.3%	1.3%	1.3%	1.3%	1.4%	8.5%	2.0% (3)
Debt Service Coverage Ratio (x)	3.2x	3.3x	3.6x	3.6x	3.0x	5.2x	1.2x	NA
Liquidity								
Days Available Cash and Investments on Hand (#)	152.6	152.0	151.1	150.8	148.4	144.4	NA	40.7
Operating Cash Flow (%)	4.2%	4.6%	4.6%	4.7%	4.7%	4.7%	NA	NA (4)
Solvency								
Ratio of Long Term Debt to Total Capitalization (%)	30.7%	28.3%	26.1%	24.0%	20.6%	18.4%	NA	NA
Ratio of Cash Flow to Long Term Debt (%)	22.5%	26.4%	28.4%	30.8%	36.0%	40.0%	NA	NA
Net Assets Without Donor Restrictions (\$ in thousands)	\$ 1,396,796	\$ 1,460,693	\$ 1,525,588	\$ 1,591,481	\$ 1,658,337	\$ 1,726,031	NA	NA
Total Net Assets (\$ in thousands)	\$ 1,519,466	\$ 1,585,306	\$ 1,652,202	\$ 1,720,157	\$ 1,789,137	\$ 1,859,018	NA	NA

Footnotes:

(1) Industry data metrics based on each data source's respective definitions and may differ from the definitions listed below. Further, we note industry metrics only include hospitals and do not reflect health systems, including physician organizations.

(2) Data from IBIS World Industry Report 62211 - Hospital in the US published November 2021. The ratio used are for 2020, the most recent available data.

(3) Net income margin from IBIS and Definitive Healthcare data treated as an equivalent to excess margin.

(4) Operating Cash Flow does not take into account of the cash outflow from taxes.

The Key Metrics fall into three primary categories: profitability, liquidity, and solvency. Profitability metrics are used in the evaluation of management performance in how efficiently resources are utilized. Liquidity metrics, including common ratios such as “days of available cash and investments on hand”, measure the quality and adequacy of assets to meet current obligations as they come due. Solvency metrics measure the company’s ability to take on and service debt obligations. Additionally, certain metrics can be applicable to multiple categories. The table below shows how each of the Key Metrics is calculated.



Key Financial Metrics and Ratios

Ratio Definitions

Profitability

Operating Margin (%)	(Loss)/Gain on Operations Divided by Total Operating Revenue
Excess Margin (%)	Excess of Revenue Divided by (Total Operating Revenues + Non-Operating Income)
Debt Service Coverage Ratio (x)	(Excess of Revenue + Depreciation and Amortization + Interest) Divided by (Principal Payments and Interest)

Liquidity

Days Available Cash and Investments on Hand (#)	(Cash and Restricted or Limited as to Use) Divided by [(Total Operating Expenses Less Depreciation and Amortization) Divided by 365 Days]
Operating Cash Flow (%)	(Operating Income + Depreciation + Change in Working Capital) Divided by Total Operating Revenue

Solvency

Ratio of Long Term Debt to Total Capitalization (%)	Long-Term Debt (Non-current Portion of Long-Term Debt + Long-Term Lease Obligations) Divided by Total Capitalization (Long-Term Debt + Long-Term Lease Obligations + Unrestricted Net Assets)
Ratio of Cash Flow to Long Term Debt (%)	Total Cash Flows from Operations (Operating Income + Depreciation + Change in Working Capital) Divided by Long-Term Debt (Non-current Portion of Long-Term Debt + Long-Term Lease Obligations)
Net Assets Without Donor Restrictions (\$ in thousands)	Total Unrestricted Net Assets
Total Net Assets (\$ in thousands)	Total Net Assets

1. Revenue

We analyzed the projected revenue within the Projections. Revenue for the Applicant includes NPSR² and other operating revenue. We note that the cumulative NPSR comprises 90.1 percent of the cumulative total net revenue from FY 2022 through FY 2027.

Total NPSR for the Projections are expected to grow by 10.6 percent in FY 2022 when compared to FY 2021. It is important to note that the Management provided FY 2021 financials only include three months of Harrington Hospital's performance while the FY 2022 represents a full year. For the remainder of the Projection Period (FY 2023 through FY 2027), Management projected revenue growth of 0.0 percent. As noted previously, the FY 2023

² NPSR ("Net Patient Service Revenue")

through FY 2027 revenue projections consider changes in volume only, not the impact of inflation or price increases. Per the budget presentation, NPSR growth in FY 2022 is largely due to Management's expectation that operations will return to normal after being significantly impacted by the global pandemic caused by COVID-19. When compared to FY 2021, FY 2022 net revenue is only expected to increase approximately 4.6 percent (relative to the NPSR growth rate of 10.6 percent). Management indicated that this expected revenue growth relates to several initiatives that UMMH implemented recently or plans to implement early in FY 2022. One such initiative is UMMH's ambulatory transformation which has helped the Applicant more efficiently utilize its existing capacity, clinical network, and staff. The addition of telemedicine and finding alternative sites of care ("Hospital at Home") helps add capacity without needing to use physical rooms. As a result of UMMH's various operational improvements, the Applicant expects to be able to allocate patients with low acuity cases more efficiently and enable senior physicians to focus more on providing care to an expanded patient group with higher acuity levels. Accepting higher level acuity cases will help increase UMMH's volume and value per unit metrics.

In order to determine the reasonableness of the projected revenue, we reviewed the underlying assumptions upon which Management relied. Based upon our review of the information provided and the discussions noted above, we understand Management relied upon historical operating results and anticipated demographic trends in UMMH service area. The revenue growth anticipated for FY 2022 is below the three-year compound annual growth rate ("CAGR") and also within the range of annual revenue growth rates for the Applicant between FY 2017 and FY 2020 as indicated in the table below. We note UMMH's growth before

COVID-19 was between 2.0 to 5.9 percent in FY 2018 and FY 2019 respectively. The increased acuity and volume were a large driver of the 7.9 and 11.1 percent growth UMMH saw in FYs 2020 and 2021, respectively, as well the addition of Harrington Hospital in FY 2021.

	FY2022 Growth	CAGR (2017 - 2020)	Annual Growth Range (2017 - 2020)
Net Revenue Projection	4.6%	5.2%	2.0% - 7.9%

Based upon the foregoing, it is our opinion that the revenue growth projected by Management reflects a reasonable estimation of future revenue of UMMH. We note that the assumed revenue growth of 0.0 percent beyond FY 2022 is based solely on Management's consideration of changes in volume only, not the impact of inflation or price increases beyond FY 2022. We further note that Management's assumption of de minimis volume growth beyond FY 2022 is consistent with recent historical and projected demographic trends in UMMH's service areas ranging from 0.4 to 0.5 percent annually.

2. Operating Expenses

We analyzed each of the categorized operating expenses for reasonableness and feasibility related to the Projections. The operating expenses in the analysis include salaries and wages, employee benefits, professional fees, purchased services, pharmacy, medical supplies, non-medical supplies, utilities, insurance, rental leases, other direct expenses, system allocation expenses, depreciation and amortization, and interest expenses. Total expenses within the Projections are estimated to grow 6.6 percent in FY 2022 compared to the 9.4 percent in FY

2021. The main drivers of the higher expenses are increased salaries and wages, benefits and supplies due to inflation, supply constraints, and labor shortages. Management noted that these same factors contributed to the 9.4 percent expense growth in FY 2021. Management expects some drivers of this expense growth to moderate in FY 2022, resulting in a lower year-over-year growth rate of 6.6 percent. Thereafter, similar to operating revenue, Management held operating expenses constant, assuming a 0.0 percent growth for FY 2023 through FY 2027, except for interest expense which is projected based on UMMH's projected level of debt and current terms. The following table indicates the projected increase in FY 2022 is slightly above the three-year compound annual growth rate ("CAGR") and within range of annual expense growth rates between FY 2017 and FY 2020.

	FY2022 Growth	CAGR (2017 - 2020)	Annual Growth Range (2017 - 2020)
Expense Projection	6.6%	5.2%	3.6% - 7.0%

Based upon the foregoing, it is our opinion that the operating expenses within the Projections reflect reasonable estimation of future expenses of the Applicant. We note that the projected total expenses as a percentage of total revenue range from 99.5 to 99.8 percent from FY 2022 to FY 2027. We further note that this level of total expenses is consistent with the historical total expenses as a percentage of total revenue which ranged from 99.5 to 101.1 percent from FY 2017 to FY 2020.

3. Capital Expenditures and Proposed Project Financing

The addition of the new CT unit is the most cost-effective option available to expand the CT services capacity promptly and seamlessly of the emergency department at UMMH. The expansion requires no significant construction or disruption to the existing services. Per Management, the total capital expenditures for the CT unit and required construction is \$3,832,862. Within the total amount, \$1,164,881 is expected for the purchase of the CT unit, and the remaining amount is related to fitting out the space that will house the new CT unit. In addition to the above capitalized expenses, the first-year operating expenses for the CT unit are anticipated to be \$856,168. This represents the incremental annual labor costs, CT maintenance service costs and miscellaneous supply costs required to operate an additional CT unit. We reviewed the financing plans for the Proposed Project and understand that the expenditures related to the Proposed Project are expected to be funded through the Applicant's cash on hand. We note that the cash and cash equivalents balance included in the Projections is approximately \$1.28 billion in FY 2022, of which the initial outlay expenses and the annual operating expenses of the Proposed Project represents approximately 0.3 percent. We note the model indicates a consistent level of the total cash balance through the projection period. Based on the noted factors, there appears to be sufficient room to accommodate the financing for the Proposed Project within the Applicant's available capital without the need for debt financing.

VI. FEASIBILITY

We analyzed the Projections and Key Metrics for the Proposed Project. In preparing our analysis we considered multiple sources of information including industry metrics, historical results, and Management expectations. It is important to note that the Projections do not account for any anticipated changes in accounting standards. These standards, which may have a material impact on individual future years, are not anticipated to have a material impact on the aggregate Projections.

Within the projected financial information, the Projections exhibit a cumulative operating EBITDA surplus of approximately 5.2 percent of cumulative projected operating revenue for the six years from FY 2022 through FY 2027. Based upon our review of the relevant documents and analysis of the Projections, we determined the anticipated EBITDA surplus is a reasonable expectation and based upon feasible financial assumptions. Accordingly, we determined that the Projections are reasonable and feasible, and not likely to have a negative impact on the patient panel or result in a liquidation of assets of UMMH.

Respectively submitted,

A handwritten signature in black ink, appearing to read "E. W. Lynch", is written over a light blue horizontal line.

Erik Lynch
Partner, BDO USA LLP