



LONG RANGE PLANNING AND FACILITIES ANALYSIS
RELATED TO THE TARRANT COUNTY HOSPITAL
DISTRICT, D/B/A JPS HEALTH NETWORK

JUNE 2017

CUMMING
Building Value Through Expertise

TABLE OF CONTENTS

SECTION 1	INTRODUCTION	1
SECTION 2	EXECUTIVE SUMMARY, FINDINGS, AND RECOMMENDATIONS.....	6
	a. Ambulatory Network Plan	6
	b. Existing Project Plan Evaluation.....	10
	i. Bed Tower.....	10
	ii. Renovation/Backfill.....	16
	iii. Psych Tower	21
	iv. Demolition Options.....	25
	v. Schedule.....	26
SECTION 3	RECOMMENDED NEXT STEPS.....	27
SECTION 4	APPENDIX	30
	a. Ambulatory Network Plan	31
	b. Cost Estimates.....	79
	c. Existing Document Review.....	132
	d. Architectural Assessment	212
	e. MEP Assessment.....	246
	f. Elevator Assessment.....	363
	g. Technology Review	376
	h. Medical Equipment Review	406

SECTION 1 INTRODUCTION

Tarrant County Hospital District, d/b/a JPS Health Network (JPS) has served Tarrant County as its public hospital since 1939. Since that time, JPS has experienced growth and changes in the population served, demands for its services, and technological and medical innovations, all in an environment of financial and operational constraints. JPS serves the community from its main campus and over fifty (50) locations throughout Tarrant County. The JPS Mission is to *Transform Healthcare for the Communities They Serve*. To complete this mission JPS Vision is to be a regional and national leader in improving the patient and family experience; improving the quality and outcomes of population health; and improving access to care.

As a public hospital, JPS is uniquely equipped to provide a critical role in serving the Tarrant County community at large, including the underserved; trauma patients; behavioral health patients; correctional health patients and the training of future care providers.

As JPS continues to improve its quality, operational performance and financial stewardship, it uses data and community needs to determine how and when it should develop or expand programs and service lines to meet the needs of our community.

The JPS Board of Managers has worked closely with staff to develop a strategic plan, organizational pillars, a strategic facilities utilization plan and long-term destination metric goals, all of which consider strategic service lines, community demographic trends and the evolution of provider reimbursement in the ever-changing healthcare industry.

In the community JPS serves, the healthcare landscape is changing and becoming more dynamic and advanced – including the advent of a new medical school collaboration. The looming physician shortage is colliding with a burgeoning regional population surge. As such, JPS’s role as a leading academic medical center, with the nation’s largest hospital-based family residency program, is more critical than ever, as JPS trains the next generation of physician leaders.

Some service areas of focus include continued maintenance of JPS’ Level 1 Trauma status and expansion of its behavioral health capacity. JPS provides the only Level 1 Trauma and the only emergency psychiatric emergency services in Tarrant County. Other areas include a geriatric program addressing the rapidly expanding elder population in Tarrant County; comprehensive stroke and acute myocardial infarction service; and an extensive outpatient clinic network and school-based clinics enabling greater access to preventative care and improved health for residents of Tarrant County.

JPS is committed to serving the needs of Tarrant County and meeting the significant responsibilities of a county hospital that providing access to quality healthcare and leadership in the improvement of Tarrant County’s population health.

PROJECT BACKGROUND

In 2010, JPS retained BOKA Powell to develop the Strategic Facilities Utilization Plan (Attachment A). This served as the foundation of the needs validation and conceptual recommendations for the proposed JPS facilities development.

In 2014, the JPS Board of Managers formed a Planning Steering Committee comprised of Board Members, staff and physicians to evaluate, challenge, and once again validate the facilities plan. JPS engaged Broaddus & Associates and Blue Cottage Consulting to conduct the functional and space programming and prepare complete and detailed cost estimates of the proposed construction projects.

As a next step in the validation and update of the previous planning work completed The Long-Range Planning and Analysis Related to the Tarrant County Hospital District, D/B/A JPS Health Network, contract was executed with Health Management Associates, Inc. (HMA) on August 23, 2016.

To complement and work concurrently with HMA, Cumming formed a comprehensive team which was selected to provide Long Range Planning and Facilities analysis.

SCOPE OF SERVICES

The services to be provided by the consultant under this Agreement are included in Exhibit A, and generally include 1) the evaluation of prior reports included as part of the RFP, 2) an Architectural Facilities Assessment of the hospital/main campus, 3) a Mechanical & Electrical Facilities Assessment of the hospital/main campus, 4) a replace-in-place vs new facility cost analysis, 5) a Medical and Information Technology Equipment evaluation, and 6) an ambulatory network study.

Specific services include the following:

1. Review and evaluate the following documents:

- 2017-022 Attachment A 2010-2011 JPS Strategic Facilities Utilization Plan
- 2017-022 Attachment B Proposed Construction Project
- 2017-022 Attachment C Community Health Needs Assessment
- 2017-022 Attachment D Community Health Implementation Strategy
- 2017-022 Attachment E JPS Functional and Space Program Volume 1
- 2017-022 Attachment F JPS Functional and Space Program Volume 2 Room Data Sheets
- 2017-022 Attachment G JPS Functional and Space Program Volume 3 Equipment List
- 2017-022 Attachment H 2018 Destination Metrics
- Draft/Final HMA Report

2. An Architectural Facilities Assessment of the main hospital/main campus

3. A Mechanical & Electrical Facilities Assessment of the main hospital/main campus. This Mechanical & Electrical Facilities Assessment of the main hospital/campus beyond large system level equipment and controls. The systems that will be assessed include but are not limited to: Chillers, pumps, cooling towers, large air handling equipment, heating water boilers, steam generators, domestic water heaters, controls, switchgear, switchboards, generators, lighting system, technology system, fire alarm and fire protection systems. While this assessment will cover large system components, it will not address each and every piece of equipment. The assessment will address the approximate age, wear and maintenance, anticipated life and recommendations. The equipment will be formatted to a spreadsheet organized by facility. Our Team will provide a summary of our recommendations, prioritized by need

4. Independent Cost Estimates (D-Profiler) evaluating both the costs of the project but also the “replace-in-place” vs new construction option), including:

- Generate a full understanding of the Scope of the New Project
- Using Cumming’s national data base, complete a D-Profiler estimate of this work
- Understand how this Scope can be accomplished with the existing hospital facility
- Through a facilities Assessment, understand the current state of the existing hospital facility
- Understand the ramifications of the Medical Equipment on each option
- Using Cumming’s national data base, complete an independent estimate of the renovation/addition work required
- Compare the capital costs of each and provide a reconciliation between the previous estimates and the new estimates.
- specific Understand the delivery ramifications of operating in the existing hospital and provide high level discussion of how this may impact operation costs.

5. A major Medical and IT Equipment evaluation

6. An independent Ambulatory Network Plan evaluation - Our team will utilize prior work completed regarding demographics, socio-economics and payer mix for the determined service area. Competitor profiling and physician dynamics will be analyzed along with physician service supply, demand and need. Stakeholder interviews will be conducted to more fully understand the environment. Where needed, we will supplement information. We will then prioritize market geographies utilizing submarket definitions and evaluation criteria. We will apply quantitative healthcare specific metrics along with a qualitative overlay, looking at barriers or obstacles in the market along with competitive response and likelihood of success. We will also evaluate offensive vs. defensive strategies. Based on team collaboration and consensus, we will develop facility site and location recommendations, an implementation plan, and a phasing approach to best deploy physician and service resources for the future. We will evaluate current facility locations, determining if they are optimizing their current locations. Considerations will include:

- Access and visibility
- Scale to market opportunity
- Patient experience
- Population health
- Partnership and alignment opportunities
- Consolidation opportunities
- Rental rates, lease expirations, and facility optimization
- Master campus plan and decanting strategy
- Speed to market
- Strategic land acquisition

CUMMING PROJECT TEAM

Cumming engaged a variety of sub-consultants as subject matter experts to provide background and support to complete the scope of work for Tarrant County and JPS. Cumming acted as the project lead, provided the Architectural Facilities Conditions analysis and provided all cost estimating support for the project.

Percival Health Advisors provided the Ambulatory Network Plan and strategic support relating to the review and evaluation of the previous documents.



WHR Architects provided planning and evaluation support relating to the planning and design information included in the existing documents. This support helped validate and guide the cost estimates for various options considered in the project including the size and components of the new construction and potential renovations.



EEl provided the Mechanical, Electrical and Plumbing (MEP) existing facilities conditions analysis and technical support for the development of the cost estimates and advice and analysis of various new construction and renovation options.



MEPCE provided support to the MEP analysis and provided the listing of major equipment on the JPS main campus.



Roloff International Healthcare Consulting Group provided the review and analysis of the Medical Equipment plans necessary to support the new construction plans and potential renovation plans.



Teecom provided the review and analysis of the existing JPS technology plans and goals. This information was used to provide an overview report for JPS future use as well as to support cost estimating efforts for the new construction and renovation options.



Lerch Bates provided a review and analysis of the existing facilities elevator systems. This report will provide an overview of future maintenance needs for JPS and support for cost estimating efforts for the new construction and renovation options.



SECTION 2 EXECUTIVE SUMMARY

AMBULATORY NETWORK PLAN

Overview

As part of this engagement, the Cumming/Percival Health Advisors team developed recommendations and phasing for ambulatory clinic development and deployment in Tarrant County. We reviewed and incorporated the HMA physician recommendations and projected community need. The goals of the enhanced ambulatory network are:

- More convenient access for patients
- Greater integration between JPS and the communities it serves whereby JPS patient care is delivered out in the community closer to where JPS patients live
- Increased visibility and awareness of JPS services
- Promoting the delivery of healthcare services in lower-cost sites of care (relative to higher-cost JPS inpatient sites)
- Greater utilization of preventative care to diagnose and develop treatment plans for illness before it turns into a more serious health issue

Please see the appendix for more details in the full report.

Key Take-Aways

Key findings of this analysis which contributed to the recommendations include:

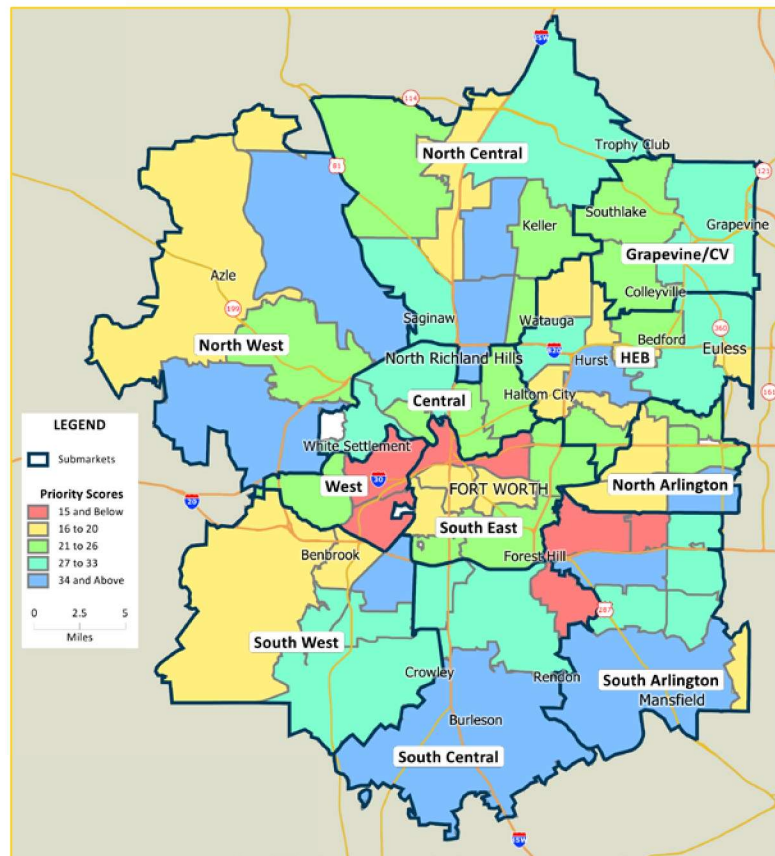
- While JPS has made significant investment in the growth of ambulatory sites over the last 10 years, the inventory of current ambulatory sites is inadequate to meet current and future needs. Some medical home health centers have long wait times and some are at or near capacity.
- Aggregating basic healthcare services and physicians in ambulatory sites has proven benefits: operational efficiencies, team-based care in group practices, and cost benefits of shared staff and overhead
- New sites will provide an alternative to main campus congestion while delivering outpatient care in a lower cost setting and at a lower investment expense while providing a better patient experience
- JPS ambulatory care center (ACC) growth has been rapid. Over the years the system has developed a successful medical home model of care to meet the unique primary care needs of its targeted population. The focus of the recommendations has therefore been to leverage the success and established best practices of this model into a greater number of targeted locations where access is needed most.
- While the focus of the ACC planning has been on the primary medical services provided at these medical home locations, behavioral health should also be embedded in new medical home sites as needed (expanding on the current medical home model at sites that have these services embedded).
 - These services could also be expanded into telehealth
 - Primary care services should include geriatrics at these sites
- For specialty physician ambulatory services, these are primarily offered at the main campus and in Arlington. Specialty clinics on campus are not ideally located and are impacted by facility issues; these need an on-campus solution with more space and new or reconfigured space. Additionally, the

Cancer Center near the campus is at capacity, has operational issues, and needs a new dedicated Cancer Center facility on or near campus.

Process and Recommendations

As part of this process, we developed a methodology to prioritize zip codes for targeted ACC sites based on multiple quantitative demographic and healthcare metrics supported by a qualitative overlay. The methodology heavily factored in the current provision of services and gaps in physician coverage (both from a market and JPS perspective). A map of priority zip codes is included below, with the highest scores (blue) having the highest priority (note that Burleson has only 21% of its population in Tarrant County and therefore it was downgraded as a priority target).

Note that many zip codes with lower priority scores have been determined to have in-place JPS facility capacity that is sufficient to meet projected future healthcare demand. Conversely, higher priority zip codes typically are deemed to have insufficient facility capacity to meet projected healthcare demand and are better positioned for success.

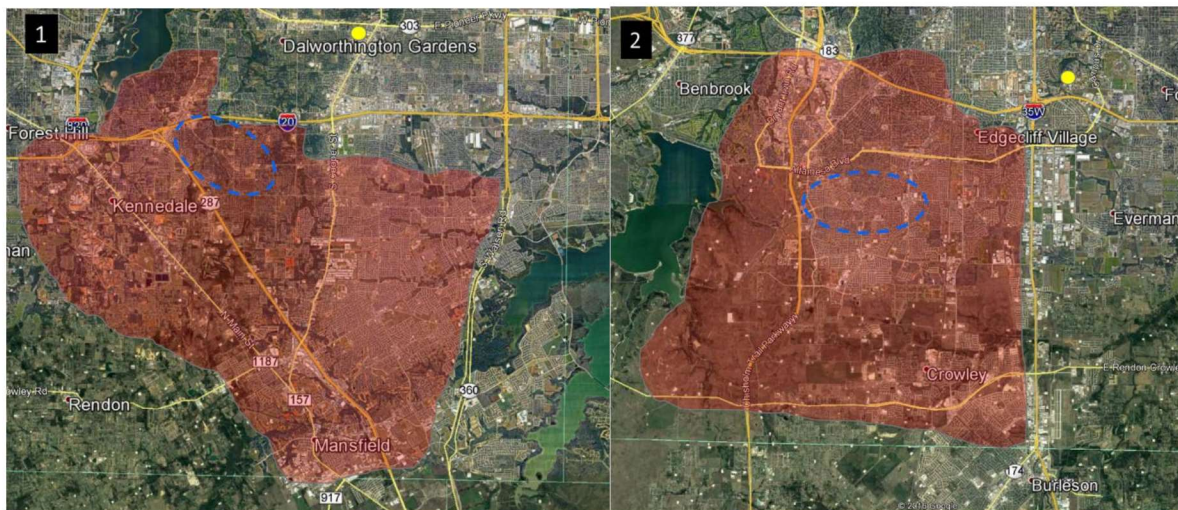


Based on the prioritization scores and other factors, 4 sites were targeted for new ACC development. All sites were given a “suggested” opening date, all in the next 10 years, but this could change depending on circumstance or opportunities (e.g., land or site opportunities in suggested areas). Availability of financial resources will be a key consideration in implementation of new sites. A 5th site (in the HEB area closer to Richland Hills or West Hurst) was recommended beyond 10 years, although this could move up in the timeline if the newly relocated Northeast hits capacity quickly or if it is warranted by market conditions.

The 4 new recommended sites are (on the accompanying maps the red shaded area is the target population, yellow dots are existing JPS ACCs, and blue dotted circles are the general recommended area for a new site):

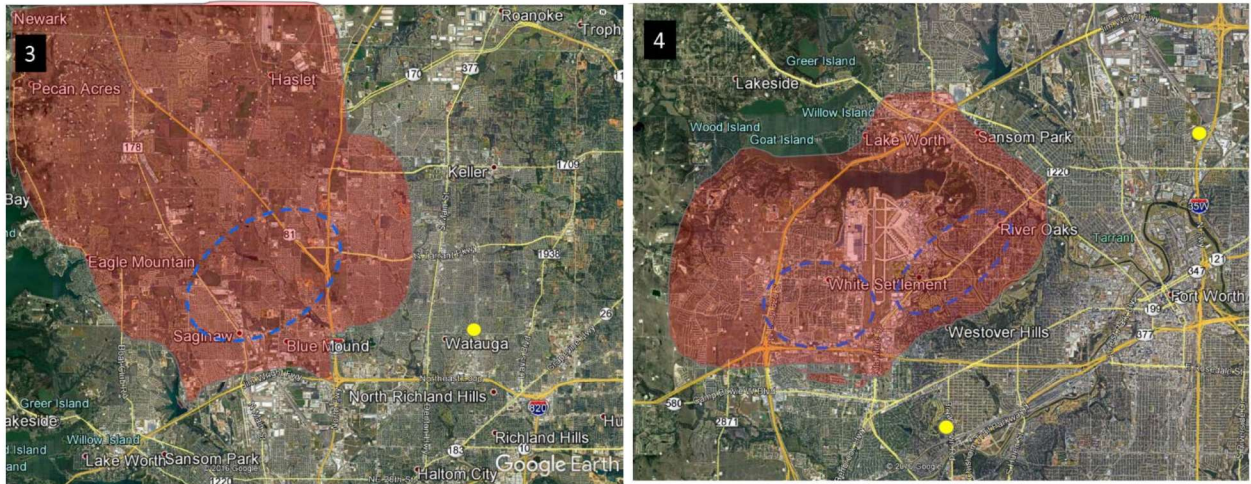
1- SOUTH ARLINGTON ACC: Service area population of 191,000 with 5-year growth of 9%. Focus is on the populations south of the current Southeast site, South Arlington Residents who access Green Oaks Blvd. and Sublett Rd., and the Mansfield population. The Southeast ACC, in a plaza with a site that consolidated other sites in 2015, serves significant density in North Arlington and has double JPS visits compared to other medical homes.

2- SOUTH WEST ACC: Service area population of 166,000 with 5-year growth of 8%. The Benbrook population northwest of the golf course will more easily access the Viola M. Pitts ACC. Most of the Burleson population is not in Tarrant County but the NW portion within the County could access this proposed site. South Campus ACC does not have a natural direct route to the clear majority of the target area.



3- NORTH WEST / NORTH CENTRAL ACC: Service area population of 201,000 with 5-year growth of 12%. Road patterns in this area are challenging with some industrial areas, highway 81, natural barriers, and non-intuitive indirect routes. The Bus 287/Bailey Boswell intersection is a 20-minute drive from Gertrude Tarpley ACC.

4- NORTH WEST / CENTRAL ACC: Service area population of 125,000 with 5-year growth of 6%. The service area will slightly overlap with the western edges of Diamond Hill's service area, which is in a residential area near schools. Based on road patterns, the Viola M. Pitts site does not have natural flow nor natural direct routes to most of this population. If constructed on the west side, this would likely be a smaller site. Both nearby existing sites have large volumes. JPS owns 11 acres at the bottom-center of the west circle.



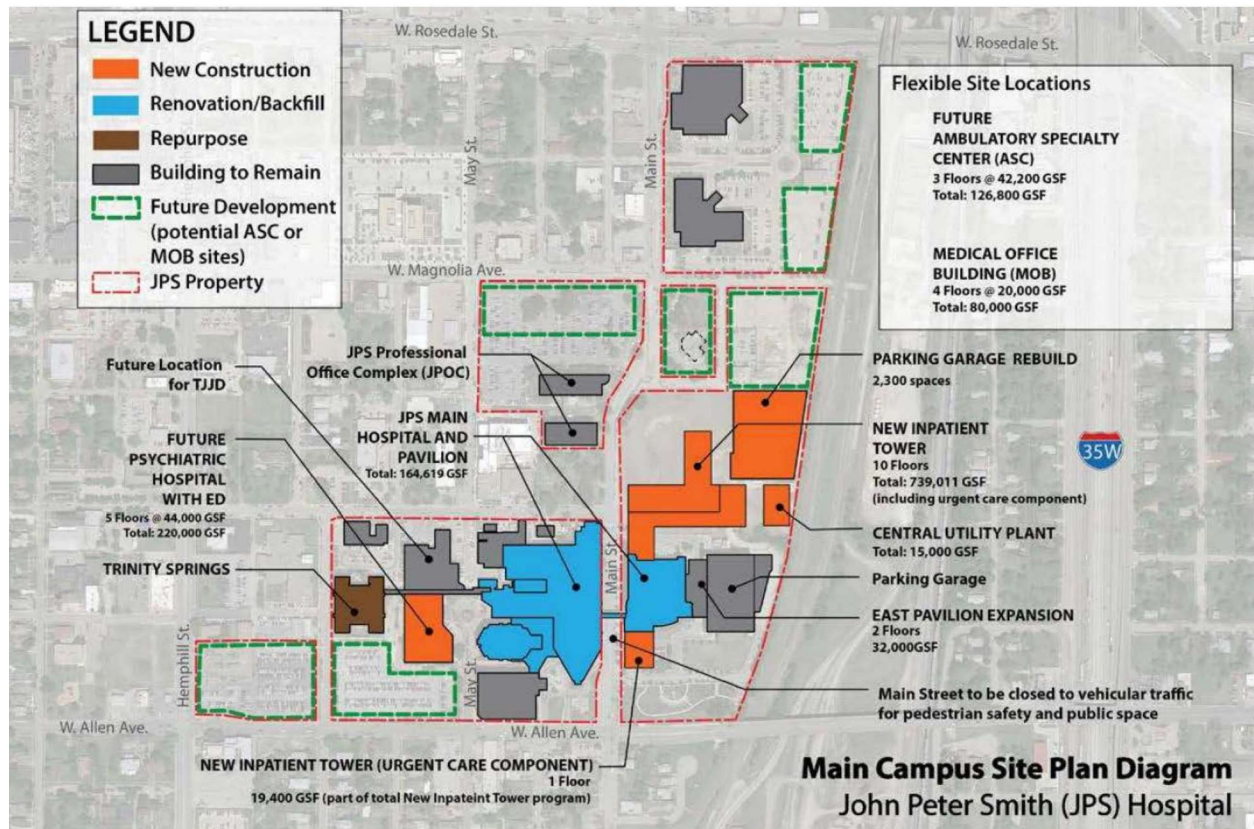
Each site will likely be in the size range of 21,000-37,000 SF depending on services, number of physicians, design criteria, and site/facility availability. Current approximate cost estimates for each of these sites is \$16 million in 2017. With escalation, these costs will be closer to \$20 at the time of construction. This total project cost includes land (note that in some cases JPS may choose to lease rather than own a site).

Specialty physician services are currently concentrated on campus, in the Southeast Tarrant ACC, or Bardin Road. The recommendation is to first plan and open revised/relocated specialty clinics in new facilities on campus as part of the master campus plans. This includes the need to relocate the Cancer Center in a new facility. Once those plans are finalized and underway, planning for a 2nd specialty site out in the community for select medical specialty services that are more community oriented is warranted. This would create a 3rd regional community specialty access point, likely in the northwest/central quadrant of the service area.

EXISTING PROJECT PLAN EVALUATIONS

New Bed Tower

The centerpiece of the proposed project in the 2014 Proposed Construction plan is the new In-Patient Bed tower. The tower as proposed in the Blue Cottage report served to replace all the In-Patient beds for the main campus, currently located on the west side of Main Street. The proposed new tower was situated on the east side of Main street, just to the north of the existing Pavilion Building. Most of this new building will house the balance of In-Patient Acute Care Beds (including Medical/Surgical, ICU, NICU, and Women’s), Administrative and Functional Support space and Public Areas. This bundle also includes the new Urgent Care, Parking capacity and the Central Energy Plant to support the new Tower (shown below in orange on the east side of Main Street).



**From 2014 JPS Proposed Construction Project*

Need for New In-Patient Beds

Beginning with the BOKA study completed in 2011 and most recently updated in the Broaddus/Blue Cottage report in 2014, additional bed needs to keep pace with Tarrant County population growth has been identified.

- Current Bed Count – 409 (60% Semi-Private)
- 2014 Study - 496 Beds at completion plus 120 shell (616 Total)
- HMA Recommends 20 Year Bed Need at 594 beds
- HMA Recommendation (with less aggressive Length of Stay Reduction), consistent with 2014 study at 664 beds

The existing patient rooms on the west side of main street (all patient rooms excluding the patient rooms in the Patient Pavilion), do not meet contemporary care models, necessary to meet industry and best practice standards. Additionally, approximately 60% of the inpatient beds are in a semi-private environment. Moving to an all private room model has several benefits, namely better patient outcomes, improved patient satisfaction (a factor in maximizing reimbursement), and improved infection control.

As part of this study the Cumming team evaluated the existing JPS buildings west of Main Street to determine their suitability for renovation to accommodate components of the existing 2014 proposed construction project. The detailed finding can be found in the Architectural Facilities Conditions Analysis, Appendix D and the MEP Facilities Conditions Analysis, Appendix E. Major findings from these are listed below:

Existing Tower Limiting for Renovated Acute Care - 1960's Vintage

- Low Floor to Floor 11' vs Current Standard 14-15'
- Existing MEP systems are significantly beyond useful life, complete replacement, without adequate space to support acute care beds.
- Small footprint leads to inefficient bed units (14-17 vs. 30 beds)
- Limited space requires added space to satisfy program (approx. 112 of 360, plus 120 shell future beds), resulting split inpatient units maintain significant operational inefficiencies
- Windows and curtain wall glass are all inefficient single pane and beyond useful life, requiring full replacement

Cumming Team Does Not Recommend Existing Tower for any Inpatient Acute Care Services

2014 Proposed Construction Project

The current bed count for JPS is 409 total inpatient beds. Beds are distributed among several of the main campus buildings on the west side of Main Street and in the more recently constructed Patient Pavilion on the east side of Main street. The current bed distribution is shown below:

JPS Existing Main Tower			JPS Pavilion Tower		
Floor Level		Bed Capacity	Floor Level		Bed Capacity
11	Pulmonary/Respiratory	19	5	PCU	36
10	Psych ED/Intake		4	PCU	36
9	Former SNF		3	ICU	36
8	General M/S	22	2	Surgery	
7	Oncology	23	1	Emergency	
6	Ortho/Neuro	20	0		
5	General Surgical	24			
4	IP Prisoners	8			
3	Med Psych (16) PCU (48)	64			
2	Cardiac NICU/Women's	121			
1					
0					
Total Beds					409

The Blue Cottage Bed Need Analysis conducted in 2014 was an update to the previous planning work completed in 2011 by BOKA. Based on that planning exercise the projected growth was from 409 current beds to 496 beds. *Note, Attachment E the Broaddus Blue Cottage full report indicated 526 beds with one and a half shell floors. Attachment B 2014 Proposed Construction Project proposed 496 beds with two full floors of shell space. The cost estimates in this report follow Attachment B with 496 beds plus two shell floors.

JPS Existing Main Tower			JPS Pavilion Tower			JPS New Tower		
Floor Level		Bed Capacity	Floor Level		Bed Capacity	Floor Level		Bed Capacity
11			5	PCU	36	10	Shell	
10			4	PCU	36	9	Shell	
9			3	ICU	36	8	M/S Acute	60
8			2	Surgery		7	M/S Acute	60
7			1	Emergency		6	M/S Acute Tele	60
6	IP Prisoners	20				5	NICU	40
5						4	Post-Partum	50
4	IP Prisoners	8				3	ICU	60
3						2	Antepartum/GYN/PAT	30
2						1	OB Triage	
1						0		
0								
Total Beds								496

The initial proposed cost estimate for the new bed tower, parking and energy plant was \$609M.

Cumming estimates that escalation from 2014 to 2017 as the following:

2015 – 6%

2016 – 6%

2017 – 5%

Aggregate Escalation 2014 – 2017 – 21.29%

Original 2014 proposed cost estimate escalated to 2017 is \$739M

The updated Cumming projected cost of the same plan is \$719M.

Notable cost differences between original estimate and Cumming Estimate:

- Escalation factor for original project was set at 6% per year; Cumming estimates 3.5% per year.
- Parking Capacity was identified and priced as a campus total. For this exercise Cumming specifically identified the parking necessary to support the bed tower only, reducing the parking count from 2,300 to 2,100. Additional parking needed for other project components will be assigned to those specifically. Notably, the balance of the required parking will be required for the Ambulatory Surgery Center (ASC) and Medical Office Building (MOB).
- Emergency department expansion identified in 2014 plans is currently under construction and funded separately from this project, all costs associated with that portion of the project have been eliminated.
- The initial estimate for the Bed Tower portion of the project in the Broaddus/Blue Cottage report assumed 1.5 floors of shells space, but the Proposed Construction project included two floors shell space. It's not noted how that deviation impacts the construction costs initially developed, and it should be noted that the costs in each report are not remarkably different. The Cumming estimate followed the Proposed Construction Project plan with two full floors of shell space.

Additional Bed Tower Cost Considerations

Program Size Updates

The review of the existing program used to generate the 2014 proposed construction project lead to an increase in the overall size of the building. Several regulations have been updated since the original plan and the recommendation is that the patient room size (including the toilet room) be increased from 290 square feet to 340 square feet. This increase in size is based on similar experience with teaching institutions necessitating additional space in the patient room for an education zone. **The added cost associated with the program changes is \$30M.**

Parking Garage Size Increase

Our team recommends increasing the size of the parking garage from 350 sf per car to 380 sf per car. Our experience shows that this added circulation space creates a more usable and safe parking garage, particularly in areas with a higher proportion of larger vehicles, trucks and SUVs. **The added cost to increase the size of the parking garage is \$5M.**

Added Shell Beds Based on HMA Recommendations

Extrapolating from the JPS Connection population, HMA estimates 594 beds will be needed for JPS to meet the needs of current population percentage (34%) 20 years in the future. This includes an aggressive admission/LOS reduction of 1% per year. This results in 185 additional beds with this most conservative outlook. *From HMA Final Recommendations Report.

To accommodate the bed need included in the HMA report, the two additional shell floors should be completed. The estimate below assumes the additional beds will be M/S Acute care beds, as the HMA report is not specific to a service mix nor the phasing need of beds over the 20 years projected. Premium costs should be evaluated to upgrade any of the bed units to an ICU or M/S Acute Tele bed unit.

JPS Existing Main Tower		JPS Pavilion Tower		JPS New Tower	
Floor Level	Bed Capacity	Floor Level	Bed Capacity	Floor Level	Bed Capacity
11				10	M/S Acute 60
10				9	M/S Acute 60
9				8	M/S Acute 60
8				7	M/S Acute 60
7				6	M/S Acute Tele 60
6	IP Prisoners 20	5	PCU 36	5	NICU 40
5		4	PCU 36	4	Post-Partum 50
4	IP Prisoners 8	3	ICU 36	3	ICU 60
3		2	Surgery	2	Antepartum/GYN/PAT 30
2		1	Emergency	1	OB Triage
1				0	
0		0		0	
				Total Beds	616

Projected Cost to Complete Two Shell Floors to increase capacity by 120 M/S Acute beds - \$64M

Added beds for less aggressive LOS Reduction

As noted in the Cumming Team review of the HMA Bed need projection, the HMA projection assumes an aggressive utilization reduction of market bed need or Length of Stay (LOS) reduction of 20%. See HMA report "System Capacity and Population Needs" April 25, 2017 (see page 13). The Blue Cottage recommended number is between their "No LOS Reduction" scenario and "LOS Reduction" scenario, with an effective LOS reduction of 10.6%. Adjusting the HMA recommendation to account for a less aggressive LOS in line with the Blue Cottage report increases the projected bed need to 664. To accommodate this added bed need one additional bed floor is added to the new tower.

JPS Existing Main Tower		JPS Pavilion Tower		JPS New Tower	
Floor Level	Bed Capacity	Floor Level	Bed Capacity	Floor Level	Bed Capacity
11				11	M/S Acute 60
10				10	M/S Acute 60
9				9	M/S Acute 60
8				8	M/S Acute 60
7				7	M/S Acute 60
6	IP Prisoners 20	5	PCU 36	6	M/S Acute Tele 60
5		4	PCU 36	5	NICU 40
4	IP Prisoners 8	3	ICU 36	4	Post-Partum 50
3		2	Surgery	3	ICU 60
2		1	Emergency	2	Antepartum/GYN/PAT 30
1				1	OB Triage
0		0		0	
				Total Beds	676

Projected Cost to Complete add one full M/S Acute bed floor further increasing capacity by 60 M/S Acute beds - \$47M

Maintain Existing Materials Management and Laundry Services - Cost Savings - \$24M

- Lower Staffing Efficiency due to remote location
- Existing Capacity Issues Remain Unresolved

Renovate Food Service Department in Existing Location - Cost Savings - \$10M – Not Recommended

- Limited size due to existing constraints
- Lower Staffing Efficiency due to remote location
- Existing Location is Sub-Optimal

Optimize Existing Energy Plants to Eliminate New Plant - Cost Savings - \$33M – Recommended

As indicated in the MEP existing conditions analysis (see Appendix E), the main component of the energy plant for JPS is chilled water generation and distribution. Analysis indicates that the chilled water generation capacity is sufficient to support the new tower addition without additional capacity. This savings includes the net cost to optimize the distribution system to eliminate the need for added chiller capacity. This option applies to the base project only, including full build out of shell space. If additional floors are added to the project further analysis is warranted.

Renovation/Backfill

Cumming reviewed and evaluated the cost estimate for the renovation and back-fill portion of the project. The 2014 report included a high-level program for departments identified for renovation along with total square footage. The chart shown below is the basis for the initial estimate and the Cumming review estimate:

Main Hospital and Pavilion Renovation Program Summary

Department	GSF Total	Reno Type	Comments
1 Diagnostic and Treatment Services			
2 Emergency Department	22,300	Heavy	Renovate the Purple fast track pod for increased acute volume in ED, renovate for added triage, renovate Reg/Admitting space to ED (Reg/Admitting moving to new lobby); additional 15k SF for renovation of existing pods and reconfiguration (not originally identified in BOKA FUP)
3 Observation Unit	32,601	Med	Moving to E3
3 Surgical Services (Storage, Anesthesia Work, Officing)	11,000	Med	Coupled with new space expansion
4 Sterile Processing Department	1,825	Med	Coupled with new space expansion
4 Rehabilitation Services (Outpatient)	10,260	Heavy	Outpatient expanding, Inpatient support in New Tower
6	Subtotal		
	77,986		
7			
8 Administrative and Public Services			
9 Simulation/Education	41,192	Med	Main Tower Level 02
10	Subtotal		
	41,192		
11			
12			
13 Hospital Clinics			
14 Family Medicine/Medical Home Clinic	18,731	Heavy	Main Tower Level 01
15 Ortho/Podiatry Clinic	11,214	Heavy	Main Tower Level 01
16 Specialty Clinic	15,496	Heavy	Main Tower Level 02
17	Subtotal		
	45,441		
18			
19			
20			
21 Total Gross Square Feet (Medium Renovation)	86,618		Full SF identified in BOKA 2013 FUP w/ some additions
22 Total Gross Square Feet (Heavy Renovation)	78,001		Full SF identified in BOKA 2013 FUP w/ some additions
23 Total Gross Square Feet	164,619		

*From Broaddus/Blue Cottage 2014 Report

The initial proposed cost estimate for the renovation and backfill portion of the project was \$94M.

Cumming estimates that escalation from 2014 to 2017 as the following:

2015 – 6%

2016 – 6%

2017 – 5%

Aggregate Escalation 2014 – 2017 – 21.29%

Original 2014 proposed cost estimate escalated to 2017 is \$114M

Cumming Estimate of Original Plan - \$103M

Notable cost differences between original estimate and Cumming Estimate:

- Escalation factor for original project was set at 6% per year; Cumming estimates 3.5% per year. Since the renovation portion of the project follows the completion of the new tower, the mid-point of construction is not projected until 2023, enhancing the escalation difference significantly.

Further review of the existing plans confirmed the comment included in the 2014 Proposed Construction Plan that “A substantial portion of the existing bed tower will be reserved for future growth/expansion to be defined in the future.” Based on the information captured below, the Cumming team estimates that the overall available space for future use to be 180,000 sf. This calculation is based on a review of the new program and existing department square footage. As such, the overall number will not be exact, rather it serves as an estimate to approximate the available area.

Existing Department	Square Footage	New Location
Existing Basement		
Trinity Springs (Psych)	32,977	Psych Hospital
Materials Mgt	31,416	New Tower
Food Services	17,877	New Tower
IP Pharmacy	5,945	New Tower
Central Sterile	7,263	New Tower
Administration	2,271	New Tower
Basement Total	97,749	

Existing First Floor		
Trinity Springs (Psych)	32,977	Psych Hospital
IP Registration	2,545	New Tower
Urgent Care	15,345	New Tower
Laundry	5,424	New Tower
Emergency Department	22,300	Renovated In Place
OP Pharmacy	2,277	Already Relocated
OP Registration	1,363	TBD
Physical Therapy	8,260	Renovated In Place
Gift Shop	993	New Tower
First Floor Total	91,484	

Existing Second Floor		
Mother Baby	81,053	New Tower
Respiratory Therapy	1,914	New Tower
Specialties Clinic	23,523	2nd Floor OP Building
Second Floor Total	106,490	

Existing Department	Square Footage	New Location
Existing Third Floor		
Telemetry	11,138	New Tower
Endoscopy	4,021	New Tower
Observation	10,467	E3 Renovation
Cardiology	2,287	New Tower
Progressive Care	26,453	New Tower
Executive Offices	5,789	New Tower
Third Floor Total	60,155	

Existing Fourth Floor		
Infusion/Dialysis	12,750	New Tower
Family Medicine Clinic	24,125	1st Floor OP Building
Fourth Floor Total	36,875	

Existing Fifth Floor		
Med/Surg	12,750	New Tower
Fifth Floor Total	12,750	

Existing Sixth Floor		
Orth Med/Surg	12,750	New Tower
Sixth Floor Total	12,750	

Existing Seventh Floor		
Med/Surg	12,750	New Tower
Seventh Floor Total	12,750	

Existing Eighth Floor		
Med/Surg	12,750	New Tower
Eighth Floor Total	12,750	

Existing Ninth Floor		
Skilled Nursing	12,750	Eliminated
Ninth Floor Total	12,750	

Existing Department	Square Footage	New Location
Existing Tenth Floor		
Psych ED	12,750	Psych Hospital
Tenth Floor Total	12,750	

Existing Eleventh Floor		
Infectious Disease Unit	12,750	New Tower
Eleventh Floor Total	12,750	

Total Vacated Space	482,003
Renovation Program	164,619
Prisoner Beds	25,500
Demolished Space	5,360
Unoccupied Space	286,524

Notable Existing Square Footage	
Trinity Springs	65,954
Materials/Laundry	36,840

Remaining Space, if TS and Materials Buildings Demolished or Reused
183,730

Potential Re-Use/Renovation Options

Trinity Springs Building - 65,000 square feet, existing In-Patient Psych Beds

In discussions with JPS, indications were that the Trinity Springs building could be re-purposed, potentially as is to consolidate all the IT services for the system into one building. Limited renovations and other upgrades to support technology needs should be anticipated. Further review of this option and other options should be vetted with operational considerations.

Laundry/Materials Management Building – 36,000 square feet, existing laundry and Materials Management

As discussed under the new bed tower options, locating Materials Management and Laundry services across Main Street is an option to reduce costs. Separating these services from the bulk of the inpatient services they support has some operational inefficiencies and issues that JPS should fully vet and consider prior to drawing a conclusion on this option. Further, options to out-source laundry could further reduce the need for added square footage. This would allow the existing laundry department to be utilized for staging and storage of linens and would help alleviate the space issue which leads to laundry cart storage in the corridors. Laundry outsourcing is a common practice in many more urban hospitals, and options are available for JPS in the Ft. Worth/Dallas area.

Should Materials Management and Laundry be relocated to the new tower, this building has limited utilization for re-use. As such, Cumming recommends demolition in that case.

Hospital Tower and Attached Buildings – 180,000 sf, existing in-patient services

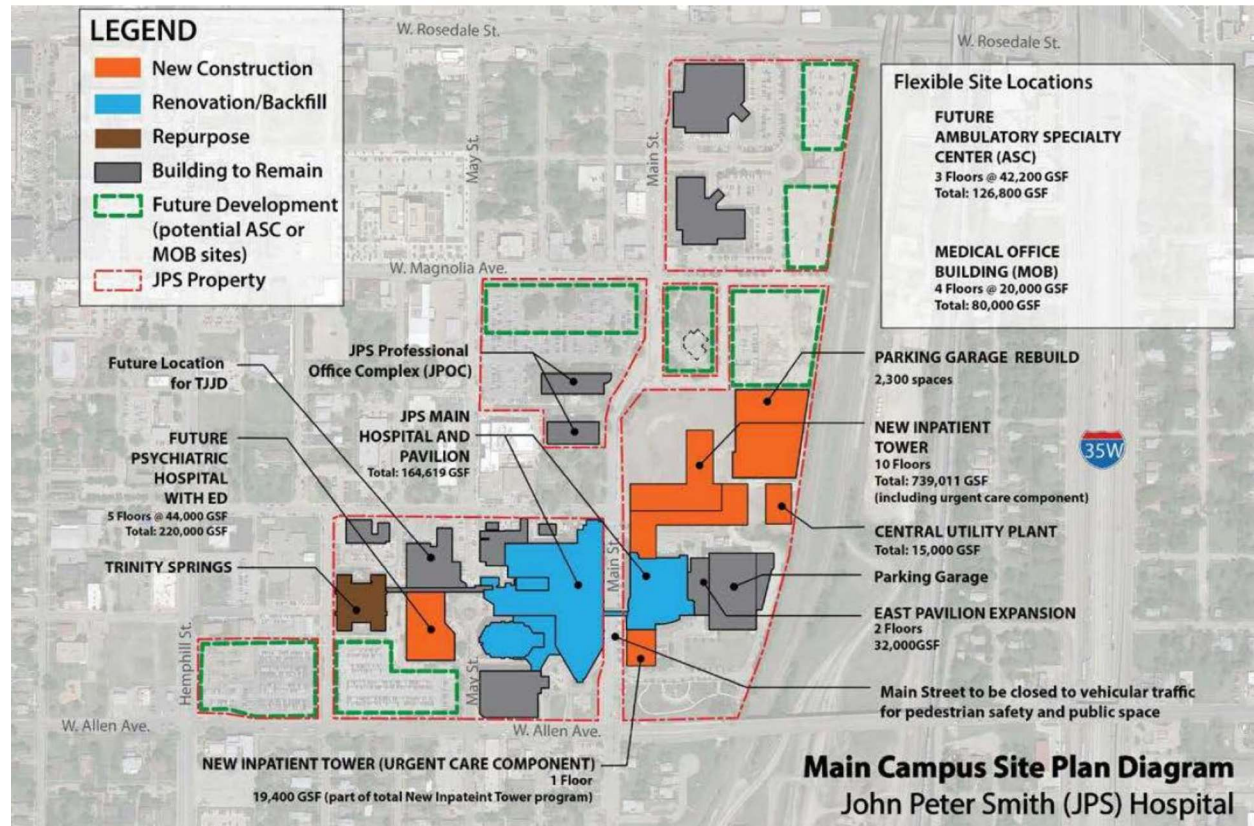
As discussed in the New Tower review and throughout the various facilities assessments (detailed reports included in the Appendix to this report), the existing tower has limited utility for re-use, and Cumming does not recommend re-use for in-patient acute care beds. Other options for re-use include Outpatient Services, Clinics, Offices, Psych Services and other Ancillary Uses.

Recommended Next Steps

- Evaluate existing JPS Network (and Tarrant County as appropriate) for additional uses of renovated space. A cursory review of JPS leased property within a one mile radius of the main campus revealed over 70,000 sf of office/clinic space which could be relocated to the main tower.
- Evaluate the proposed ASC and MOB coordinated with overall space plan for main campus back-fill to optimize space usage.

New Psych Hospital

Cumming reviewed and estimated the cost of the new Psych Hospital. The new Psych Hospital was proposed to be constructed west of the existing bed tower and east of the existing Trinity Springs Building. The location is included in the site plan below.



**From 2014 JPS Proposed Construction Project*

The 2014 Proposed Construction plan and the Blue Cottage study included the supporting reasons for a new Psych Hospital. The primary reason for the new hospital is to allow for expansion of the existing Psych services to support a growing need within Tarrant County for in-patient behavioral health care. JPS currently has 96 in-patient psych beds on the main campus, primarily in the Trinity Springs Building. Additionally, JPS leases 36 beds, for a total of 132 beds currently available on campus for psychiatric services. The study completed in 2014, resulted in a new hospital with 148 beds at completion, plus one full floor of shell space for a total potential of 198 beds. Planning conducted by HMA recently suggests that the JPS need for inpatient psych beds could be as high as 516 in twenty years.

Additional issues face the existing psych services due to facilities and locations. Not only is the total bed count limited, but JPS relies on semi-private rooms to achieve max capacity. Often psych patients are unsuitable for a semi-private environment thereby forcing a double occupancy room be used as a private room. Additionally, Psych services are spread across the campus. The Psych Intake/ED is located on the tenth floor of the inpatient tower. Incoming patients are forced to take an elevator ride from the ground floor to the tenth floor. Once a patient is deemed in need of admission, they are then transported down the

elevator to a long tunnel to the Trinity Springs Building. Not only is this transport inefficient from a staffing standpoint, but it's also problematic to patient care.

The Psych Hospital sizing is based in a high-level space program completed by Blue Cottage and was included their 2014 study. That program served as the basis for the project costs. The program is shown below:

Psychiatric Hospital Program Summary

Program	Target Capacity	Units	Target DGSF/Room Range		Future DGSF Range		Comments	
			Low	High	Low	High		
Beds								
Adult Beds	96	beds	625	650	60,000	62,400	All private room model; 24 bed units	
Shell Floor for Additional Beds	48	beds	625	650	30,000	31,200	All private room model; 24 bed units	
Geriatric Beds	12	beds	650	675	7,800	8,100	All private room model; 60 and older	
Adolescent Beds	20	beds	650	675	13,000	13,500	All private room model	
LCA Beds	20	beds	625	650	12,500	13,000	All private room model	
Subtotal	196				123,300	128,200	Includes shell floor allocation	
Assessment Center and Partial Hospitalization								
Assessment Center	1	n/a	6,500	7,150	6,500	7,150	Waiting, 30 offices, 15 small offices, 3 group rooms, 2 conf rooms, suppt.	
Partial Hospitalization Program	1	n/a	2,500	2,750	2,500	2,750	Waiting, 5 offices, 2 group rooms, 1 conf rooms, call center, suppt.	
Subtotal	1				2,500	2,750		
Emergency and Observation								
Emergency Dept	30	rooms	800	825	24,000	24,750	estimate; depends on mix of specialists/services in development.	
Observation	16	rooms	400	425	6,400	6,800	estimate; depends on mix of specialists/services in development.	
Subtotal					30,400	31,550		
Public and Support								
Lobby, Waiting	n/a				2,000	2,200		
Staff Support	n/a				5,000	5,500		
Conference Rooms	3		400	400	1,200	1,200	20 people capacity each	
Auditorium	60		25	25	1,500	1,500		
Auditorium (Small)	20		30	30	600	600		
TBD Allowance	n/a				2,000	2,200		
Subtotal					12,300	13,200		
					TOTAL ESTIMATED Departmental GSF:	168,500	175,700	
					TOTAL ESTIMATED Building GSF:	210,625	219,625	Plus green space

*From Broaddus/Blue Cottage 2014 Report

The initial proposed cost estimate for the new Psych Hospital was \$102M.

Cumming estimates that escalation from 2014 to 2017 as the following:

- 2015 – 6%
- 2016 – 6%
- 2017 – 5%

Aggregate Escalation 2014 – 2017 – 21.29%

Original 2014 proposed cost estimate escalated to 2017 is \$124M

New Psych Hospital

Floor Level		Bed Capacity
5	Shell Beds	0
4	Adult Beds	48
3	Adult Beds	48
2	Geriatric, Adolescent & LCA Beds	52
1	ED/Intake/Admin/Support	
Total Beds		148

The updated Cumming projected cost of the same plan is \$130M

HMA Recommends Completing the Shell Space

Based on HMA’s study to meet population demands (see existing documentation review, Appendix C), the 20-year plan for JPS could be as much as 516 beds. As such, HMA recommends at a minimum completing the shell beds as part of the initial construction. The shell space allows for the addition of up to 50 beds, to bring the total beds in the new Psych Hospital to 198 beds. (Note: The phased psych bed need over the 20-year time-line was not provided in the HMA bed need estimate.)

Projected cost to complete one shell floor of Psych Beds is \$19M

New Psych Hospital

Floor Level		Bed Capacity
5	Adult Beds	50
4	Adult Beds	48
3	Adult Beds	48
2	Geriatric, Adolescent & LCA Beds	52
1	ED/Intake/Admin/Support	
Total Beds		198

Psych Hospital Renovation Options

Cumming prepared a cost evaluation option to utilize the existing facility as a replacement for the new Psych Hospital. Discussions with JPS staff revealed significant reservations and concerns regarding this approach. Notably, their patients would not react well to receiving care in an eleven-story building, limited access to green space could violate regulatory requirements and impede proper patient care, the existing tower limits future growth and expansion. Further the renovations cannot start until the completion of the new bed tower which pushes the completion of the new Psych Beds out to 2023, later than the new Hospital option. Prior to considering or accepting this option, Cumming recommends further consultation with the JPS operating staff to hear concerns and limitations associated with renovation.

The Cumming team reviewed the existing floor plate of the main tower. At approximately 12,750 square feet the floor plate could allow up to 23 patient rooms on each floor. These are sized at the absolute minimum regulations allow. This also makes various assumptions on the MEP needs associated with the existing conditions report. This could further limit the number of beds per floor.

JPS Existing Main Tower

Floor Level		Bed Capacity
11	Psych Beds	23
10	Psych Beds	23
9	Psych Beds	23
8	Psych Beds	23
7	Psych Beds	23
6	IP Prisoners	
5	Psych Beds	23
4	IP Prisoners	
3	Psych Beds	23
2	Support, Assessment Center & PHP	
	Psych ED/Intake & Observation	
1		
0		
Total Beds		161

Projected cost to complete renovation of the existing Main Tower is \$111M

Minimal Renovation Option for Psych Services in Existing Bed Tower

Another option for consideration is to utilize the existing patient rooms with minimal renovation. The existing patient rooms in the main tower could be re-purposed for Psych Patients. Rework will need to be limited to cosmetic and safety upgrades necessary for the different use. This option is not a viable long-term solution as the MEP systems and all windows in the building are all beyond their useful life and will require replacement soon. Replacement of the MEP systems will necessitate a complete renovation of the building to bring the systems into compliance with current requirements. Again, consultation with the JPS operating staff is recommended before considering this option, as many of the concerns associated with the renovation option, plus others will be raised.

Other Demolition Cost Options

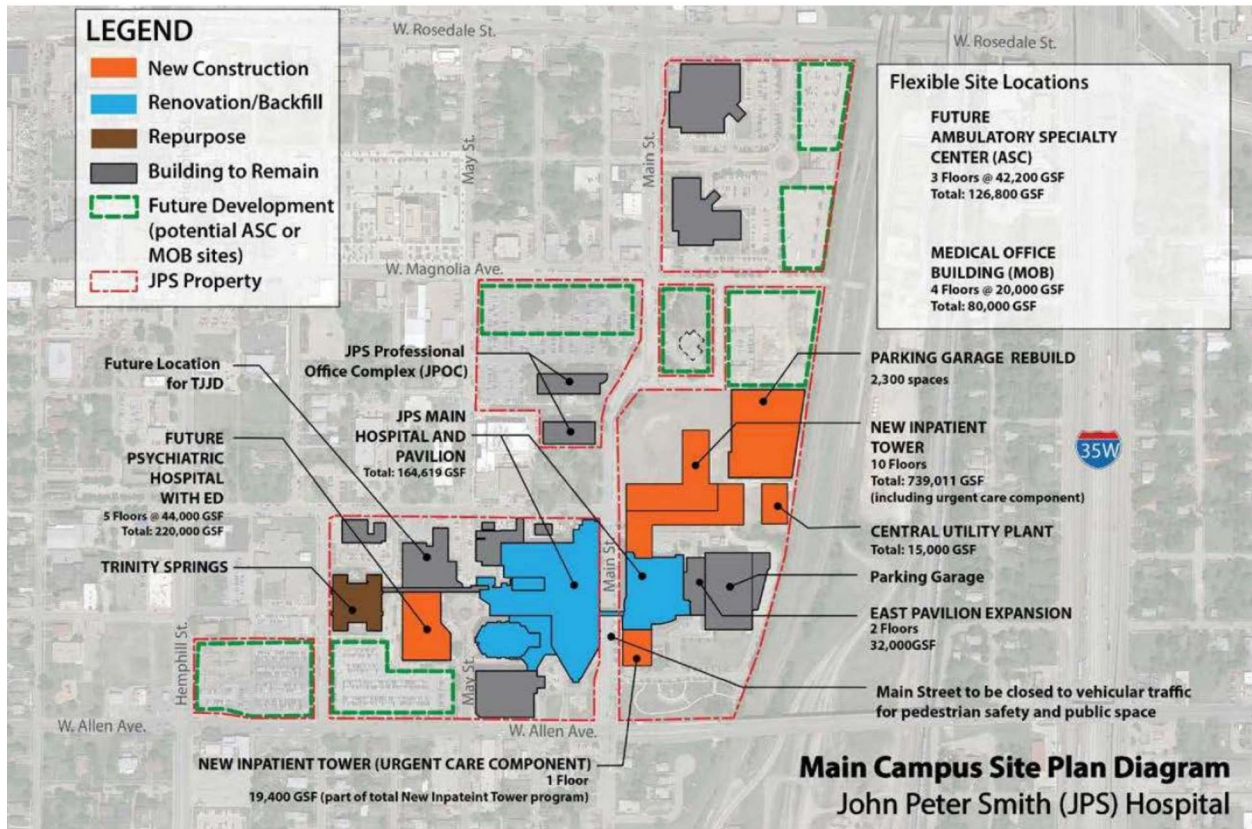
Cost to Demolish Trinity Springs Building 66,000 sf - \$3M

- Potential Re-Use to Consolidate IT Services/Other Support

Cost to Demolish Materials/Laundry Building 36,000 sf - \$2M

Cost to Demolish Balance of Existing Buildings 180,00 sf - \$35M

- Includes \$28M Renovation Allowance for Consolidation of Remaining Occupants



**From 2014 Proposed Construction Project*

Schedule

Cumming assumed a May 2018 bond funding date to generate an overall summary level schedule. The primary use of this schedule is to help accurately calculate the escalation contingency included in each project.

Project Activity	2017				2018				2019				2020				2021				2022				2023	
	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2
Project Funding Planning																										
Bond Election																										
Secure Funding																										
Project Planning																										
Project Design																										
Parking Garage Construction																										
New Tower Construction																										
Psych Hospital Construction																										
Backfill/Renovation																										

SECTION 3 RECOMMENDED NEXT STEPS

As result of the Cumming team’s evaluation and review of the previous planning work and development of the project estimates, several risks and opportunities were discovered. These items have been discussed in detail throughout the report.

Bed Need Analysis – New Patient Tower and Ancillary Services Need Analysis (OR’s, ED Positions, Imaging Modalities, Cancer Care, etc.)

The most recent detailed bed need projections were completed in 2010. In 2014, these were updated at a higher level. In 2017, HMA provided a market-based approach to bed need that focused mostly on addressing the needs of patients at <250% of poverty level.

Additional bed need analysis is recommended to review and incorporate the latest market and JPS volume trends, provide a greater degree of planning accuracy, and account for the latest developments and scenarios. These updates will provide a better understanding of room and bed need by service line, acuity type and ancillary modality for layout considerations, operational planning and facility pricing. Projections will take into account current inventory, patient utilization, market share, LOS, bed utilization, target occupancy, industry trends and emerging technologies, and projected bed-need scenarios.

Furthermore, the more recent work completed by HMA and the Cumming/Percival team related to needed physician growth and ambulatory network planning will have a downstream impact on the campus inpatient volume. Specifically, growth in physician employment by JPS will likely lead to more downstream referral volume and an increase in campus volume, especially for discharges, surgery, diagnostic and imaging services, and specialty clinic services.

Confirm and Update New Psychiatric Bed Tower Service Program

The revised recommendations include a much larger facility than was identified in the 2014 report (298 beds vs 198 beds in the previous report; the revised number is still less than the 500+ beds identified in the HMA report). Cost estimates are based on the original sizing plus 2 additional floors. However, based on the increased number beds this estimate may not accurately reflect the amount of infrastructure needed to support a larger facility. Therefore, we are recommending confirming the overall desired program needs and revisiting cost estimates to provide a more accurate picture of true costs.

Additional Planning for Outpatient and Specialty Clinic Services On-Campus (Identified in the Broaddus/Blue Cottage Report as the “ASC” and “MOB”)

HMA recommended in their most recent report that the plans for the specialty clinic MOB move forward on a more expedited timeline than originally proposed in the 2014 Broaddus/Blue Cottage report. Based on our review of the specialty clinic facility and capacity issues combined with patient experience and access issues, we agree with this recommendation. The most recent plan has not specifically identified where these services should be located and has them generally allocated between three potential locations: renovated space in the current outpatient clinic, a new ambulatory specialty center, or the new MOB. The plan for specialty clinics space needs to be more clearly articulated. By distributing clinical services over 3 or more campus locations, there is potential for disbursement inefficiencies and patient confusion on the campus.

Furthermore, since the 2014 report, we have identified additional specialty physician needs (the addition of more than 50 specialists) and clinical service needs (e.g., Cancer Center, other Centers of Excellence, geriatric services, ambulatory surgery developments). These combined activities and recommendations will impact specialty clinic space needs and campus layout considerations.

Therefore, we are recommending an update to scoping, sizing, and timing of the specialty clinic MOB and ASC which is urgently needed to relieve capacity constraints and improve operations and the patient experience on campus. A plan for location of specialty clinic services that reduces cost, maximizes efficiency, reviews and incorporates specialty recommendations, and considers ambulatory off-campus locations identified in the Cumming/Percival ambulatory network plan is needed. Along with the back-fill plan, these recommendations should be integrated and coordinated with the larger master facility campus plan to better optimize space utilization.

Identify Disposition and Backfill Opportunities for Vacated Space on the Main Campus Once the New Buildings are in Place

The 2014 Broadus/Blue Cottage report delivers a well-thought-out Functional and Space Program, especially in regards to the need for a new bed tower, Psychiatric Hospital, and campus specialty and functional needs. However, a “substantial portion of the existing bed tower” has been reserved for “future growth”, and based on our team’s review this appears to exceed 280,000 square feet of space with no future use clearly identified.

Our analysis indicates that this space is not suitable for acute care inpatient use. Furthermore, we believe that Tarrant County would be better positioned to solicit community support if a back-fill plan was evaluated and outlined. System cost savings could result relative to existing future plans if it is possible to use this space for other clinical services identified in the plan or for relocating from other less efficient spaces.

Potential options to evaluate include demolition, select outpatient clinical uses, or other office or administrative uses. This may include some services that are currently planned for alternative locations or future growth services that don’t have an immediate need but will need future expansion space. This analysis should include a review of JPS System-wide real estate and leased property for potential reuse in existing hospital buildings. It should evaluate the entire existing JPS Network (and Tarrant County as appropriate) for additional uses of renovated space. A cursory review of JPS leased property within a one mile radius of the main campus revealed over 70,000 sf of office/clinic space which could be relocated to the main tower.

Review of JPS New Tower Plan Relative to Inpatient Services Remaining on the West Side of Main Street

The Broadus/Blue Cottage report calls for the consolidation of all in-patient beds and a significant amount of ancillary inpatient services to the east side of Main Street. Some inpatient functions do remain on the west side of main street. Most notably the Observation Unit and the bulk of Imaging Services. Based on our review we noted that patient transport will remain through the bridge across Main Street, which at various points, co-mingles patient, visitor, service and staff. Ideally these services would be positioned in such a way to create separate corridors for patient and staff, supplies and support and public. As such any planning for the inpatient tower should include exploration for the option to truly consolidate all inpatient services to the east of Main Street as part of the new build, planning the building to allow for expansion to house these services in a future phase or development of a second access route across Main Street.

JPS MEP Master Plan Development

Supplemental to the planning efforts thus far, we recommend an Infrastructure Master Plan, including the main campus and all of JPS owned facilities. Infrastructure is an essential part of sustaining JPS Health functionality, and while the majority of it is behind the scenes, it is needed to power, heat, cool ventilate, and otherwise provide occupant comfort and safety.

The majority of space that currently exists on this campus will remain, and the expansion of the campus will be substantial. However, as noted in the MEP assessment report, much of the existing infrastructure is well past its useful life, fragmented, and performing marginally. However, there are some very positive aspects of what exists, in addition to the liabilities to be mitigated. There is also the element of remaining life, and what may be a substantial amount of time before the major replacements / expansion actually take place.

An Infrastructure Master Plan will be a intensive, as well as comprehensive effort. There are many behind the scenes systems to be investigated, documented in current form, evaluated and conceptually renovated to bring functionality to reasonable levels. There is also the need to consolidate existing capacity, with distribution renovations to better serve the old, as well as the new.

An Infrastructure Master Plan is intended to evaluate these systems holistically, comprehensively, and to consolidate the many systems, parts and pieces in more functional, reliable, and long lasting configurations. It should also address operating and energy efficiency, as well as comply with current code, to the extent possible.

The Main Hospital will be the most challenging, as there is very low floor to floor heights that did, and still do make the installation of adequate mechanical, electrical and plumbing systems a challenge. While not adequate for acute care systems, with proper planning and execution, performing systems can be installed, but will require complete renovations of the existing spaces to permit installations to proceed. Renovations can be phased, but a plan of attack must exist, and be adhered to if the campus will actually transition to current health care standards.

The Pavilion has been problematic since it was first built. While this facility is not a primary part of the current master plan, it will remain, and is an important part of the new acute care hospital to come. The Infrastructure Master Plan should address this facility as well, with more immediate resolution of operating issues, but also addressed in light of the new, adjacent facility to come.

SECTION 4 APPENDIX