

Services, Issues, Questions...

Scope of Anticipated Services

Programming and Master Zoning Process
Development of the Key Components

Approach to Master Planning

Ten Steps Within The Master Planning Process
Schedule and Time Factors To Consider

Programmatic Data and Trends

Why Hospitals Conduct Master Planning (MP) Services

Key Questions To Consider

Getting Started, Answering Questions and Aligning the Facts, Goals and Objectives...

The MP Agreement outlines each of the steps one might following to conduct the study. The most important aspect of this PROCESS is the CLIENT INTERFACE and project initiation. The Users/Directors or Service Line Leaders are empowered to take ownership of the process. This is manageable from three primary vantage points:

1. Tell Us Your **Current Situation**, Answer Some Questions and Demonstrate Your Understanding of our process.
2. Begin a **Serious Conversation** About Your Future, What Works Best and, In Your Opinion, What Doesn't Work now.
3. Accept to Challenge to **Visualize a New Era** of Care and Collaborate With Us on the Opportunities:
 - a. More Technology
 - b. Improved Environment and Systems
 - c. New Challenges Beyond the Norm
 - d. Creative Change Beyond the Present

Scope of Anticipated Services

Program Development And Master Planning (MP) Overview

The functional program development begins with a careful review of the client's **vision, mission and values** followed by an assessment of project goals, relevant facts, concepts, needs and issues. Each category of programmatic development is measured against; function, form, economy and time. We believe that the "evidence" referred to in Evidence Based Design (EBD) really begins when data is collected and assimilated in the pre-design phase of a project. It is here that the **FACILITY PLANNER** and **FUNCTIONAL PROGRAMMER** truly earn their commissions by asking the correct questions, organizing the data prepared and carefully assessing the facts within the project.

The Ehc programming process utilizes a programming matrix to ensure proper balance of each category and the definition of need (need in healthcare services is often defined as a Community Health Needs Assessment - CHNA). Balancing the "needs vs. wants" is a management challenge. Healthcare design firms have expanded services to include Onuma, Trelligence, GPS/Google Earth and advanced "cloud driven" programs to improve client access and expedite design decision making efforts. Computers, multi-media graphics, and the use of AutoCAD and now, Revit technology, ensure a visual and "hands on" interactive process.

Architects, planners and programmers are using Building Information Modeling (BIM) methods to further enhance building contract document production capabilities (See AIA Standards).

Process Methods

Integrated Project Delivery (IPD)

(Master Planning Starts The Process)

These overlapping and expedited methods are "exceeding" Owner expectations for enhanced continuous quality improvement (CQI) and performance metrics that are parallel to our clients own high standards of service delivery and well beyond traditional A/E work efforts. Time is money and evidence has demonstrated that technology enhances quality and the pace of efforts.

This service concept (more with less) applies to healthcare services, medical/clinical programs, architect and engineering services alike. These computer enhancements add to expedient decision making, budget management, and clear communications at all levels of planning, design, and construction. Our work is process and product oriented. The world of **INTEGRATED HEALTHCARE DELIVERY** and the **CONVERGENCE of SYSTEMS AND TECHNOLOGIES** is applicable to both healthcare and architecture. On-going discussions within the client and A/E/C worlds continue to debate the value of Integrated Project Delivery (IPD). What does this term mean, who wins and what are the risks? Ehc believes this is a win/win proposition established on the basis of:

- An Understanding Of The Hospital Building Type
- A Team of Experienced Professionals
- A Commitment to High Quality Results
- A Respect for Process and Product
- An Atmosphere of Transparency and Teamwork
- A Passion for Successful Outcomes
- A Creative Owner and Cooperative Partnership
- A Willingness to Incentivize All Parties

Qualifications

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Master Planning (MP) Process and Methods

The Master Plan and Programming Matrix

(Context, Key Planning Attributes and Expectations)

FUNCTION	GOALS	FACTS (Evidence)	CONCEPTS	NEEDS	ISSUES
Process	Mission Maximum Number Individual Identity	Statistical Data Area Parameters Manpower/Workloads	Service Groups Departmental Groups People Groups	Space Requirements Room By Room Equipment	Unique and important Performance standards that will ultimately shape/drive function and Building design.
People	Interaction/Privacy Hierarchy Of Values	Utilization Trends User Characteristics	Special Activities Priority and Procedure	Systems/Services Parking	
Activity	Security Progression	Community Value of Loss	Security and Safety Sequential Flow	Outdoor Spaces Building Efficiency	
Relationships	Segregation Encounters Efficiency Wayfinding	Time/Motion Studies Behavioral Patterns Space Adequacy KPU/Work Loads Market Statistics	Separated Flow Linkages/Networks Separated Flow Mixed Flow Relationships	Functional Alternatives Improved Systems Better Atmosphere Faster Turn Around	
FORM					
Site	Site Elements Land Use Property Ownership	Site Analysis Climate Conditions Code Survey	Enhancement/QA Climate Control New Image/Character Safety	Quality (Cost/SF) Environment and Site Influences On Cost	Major considerations that will ultimately impact building function and design quality.
Environment	Neighbors Individuality	Engineering Survey Soils Analysis FAR/GAC	Special Foundations Density	An Improved Brand Enhanced Efficiency	
Quality	Direction Access/Egress	Surroundings	Interdependence	An Affiliated Partner	The building is in the wrong Location.
Context	Image Quality Level	Physiological/Psychol. Cost/SF Efficiency	Home Base Network Orientation/Access		No land available nearby. Must expand space.
ECONOMY					
Debt Capacity	Amount Of Funds Return on Investment Cost Effectiveness	Cost Parameters Maximum Budget Time-Use Factors	Cost Controls Allocation Of Resources Multi-Functional	Project Budget Operational Costs Debt Capacity	What is the general attitude? related to the initial budget expectations and real project cost and that relationship to project quality standards?
Initial Budget	Operational Cost Capital Costs	Market Analysis Income/Reimbursement	Merchandising JV/Investment	Life Cycle Costs Energy Costs Loan Capacity	
Operating Costs	Maintenance Capital Expenses	Energy Source/Costs Economic Data	Energy Conservation Cost/Benefit	Reserves	
Life Cycle	Life Cycle Reductions Equipment Systems/Energy Automation	Competition Activities/Climate Historical Position Credit Rating	An Approved CON Design Related Groups Capital Cost Pass Through		
TIME					
Past	Preservation Master Plan Static/Dynamic Change	Significance Behind/Ahead Space Parameters Activities	Adaptability Phased/Staged Tailored/Loose Fit Convertibility	Escalation Phasing Plan Workplan	Implications Of Change/Growth on the overall long-range performance of service.
Present	Growth Controls/Limits	Projections Linear Schedule	Expandability Concurrent Schedules		Leadership is key to outcomes. Not enough time.
Future	Occupancy Date Revenue Streams	Progress Limiting Factors	Interchangeability Fast Track		Conservative leadership today.

What Is The Statement Of The Problem....Opportunity?

Process Methods

Qualifications

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Advanced Tools, Techniques and Methods

Quite often, we integrate the planning matrix of issues with the client's strategic, business, academic and operational plans (the use of "functional mapping" and LEAN principles at all levels). Beyond "lean" is the world of "process improvement". Programming results define the **return on investment factors** (ROI) for each phase of the master planning (MP) process. Using this proven method, we work with the leadership team to clearly define why the capital upgrades should occur and what the ROI factors might be over time (engineering is a key factor relating to energy and sustainability factors).

The hospital or system-wide Board of Directors will frequently request this information prior to approval of A/E/C selection. Having aligned partners during the pre-design phase maintains continuity of effort and provides "more reliable results" which become more apparent as the project unfolds. In today's healthcare environment the decision to build new or renovate is an important consideration.

Many of our clients are finding the solution is to reduce building capacity, streamline and improve operational capacity by building new, in a better location; more convenient to patients, family and staff and with a **NEW BRANDED IMAGE** which is less expensive than larger and more expensive traditional hospital buildings. Recognizing the TREND TOWARD SMALLER SCALE and more "family friendly" care is key to future campus developments. This trend doesn't negate the continuing need for higher acuity, tertiary care locations, but it does suggest that unbundling of outpatient services and moving closer to the customer is a key planning concept. The growing number of free standing Emergency Departments, short stay surgery centers, radiation therapy centers, women's birthing centers and shorter lengths of inpatient stay have demonstrated the added value for both providers and consumers.

Getting Started With The Planning Process

We typically conduct two, one-week planning sessions with hospital staff, working on site at the hospital leadership team. The use of Go To Meeting (GTM) and WebEx along with other Webinar, long distance A/V methods have reduced the amount of on-site time. This has reduced the cost of travel for our clients and, actually, enhanced the overall communications by motivating KEY STAFF FROM BOTH CONSULTANT and CLIENT perspectives. The need for formal site meetings and interactive planning remains a prerequisite for success.

At the beginning of each engagement, brief "electronic" questionnaires (in some cases using A/E/C dashboards have gained momentum) are utilized for **data collection** purposes. Historical volumes aggregated by service line and bed unit (IP/OP/ED), including market share and demographic profiles, are used to define the Key Planning Units (KPU). These questionnaires ultimately summarize the primary statistical data necessary to define clinical and support spaces, workload trends, and longer term growth projections into the future. Typically we project growth or change in 3 and 5-year increments, longer periods of time become less reliable due to the circumstances and market forces in today's healthcare world.

Ehc staff work with the departmental leadership to evaluate historical and projected workloads and project growth trends over time using both the KPU metrics, changes in processes, and improved service delivery protocols. The MP is both an **ASSET and OPERATIONAL** management tool. We emphasize a collaborative process to ensure consensus results that can be presented with confidence. The "Community Health Needs Assessments for Charitable Hospitals (CHNA)" was enacted as a part of the Patient Protection and Affordable Care Act of 2010. Changes in the ACA are continuing to evolve.

Space Listings and Room-by-Room Analysis

(Very Important Detailed Analysis)

The room-by-room space listings are prepared with staff participation to ensure proper feedback and awareness of their impact on the overall master planning program. Often, we find staff members lack clarity on how the “workload” projections and KPU’s directly impact space use and functionality (this phase of pre-design is a good time to share ideas and learn together). The space programs are linked to project phasing budgets to illustrate the impact of room sizes and quantities on the total project cost (\$/SF). Integrating the detailed attributes of medical equipment, furnishings and technology are key to having a **reliable total project budget**. Often the CM/Contractor provides input and direction at this stage of budget analysis.

The team (user and consultant) must work collaboratively to avoid over-building and to focus on the impact of CHNA and CON programs (government funding reductions and/or increases as well as state-by-state Medicaid and Medicare obligations) over time. A key attribute of this process is the “interactive style” of planning which offers staff and consultant the opportunity to interface on each detail of the space projections; functionality, equipment needs, furnishings, space design and overall environmental character. We believe the understanding of **existing conditions** is key to future plans for “effective change” over time. A MP begins with an “existing work-up”.

Client awareness and input at this phase augments and supports the capital budget management process. Users are empowered by leadership to defend space requests and justify the need for expansion. Many of our clients are encouraging “departmental proformas” to clearly demonstrate the “needs analysis” and annual budget requests.

Conceptual Evaluations

Alternative phasing concepts and functional relationships are assessed until the most logical groupings have been achieved. The clinical volumes and inpatient bed needs will be tested carefully with staff and will be based on past trends, realistic achievable outcomes, and rational future expectations over time. The experience of the consultant helps support this phase of the work. **Benchmarks** are established in comparison to other programs from the Easter Healthcare Consulting (Ehc) library.

We produce programs that are “statistically based” and “evidence driven” using “real time data” to make rationale growth projections in manageable increments. Sometimes we face anomalies which may be impacted by recruitment, staffing, political, and economic factors. During other times, regional market forces, physician capacity, specialty capabilities and board leadership impact the planning outcomes and ultimate conceptual models. Many budgetary factors are aligned with the client’s expectations, image expectations and design quality metrics. Understanding the Quality/Design comparative factors is a key attribute of early pre-design and master planning services.

Master Zoning and Preliminary Schematic Design (SD)

The campus master planning process develops preliminary one line design diagrams referred to as **master-zoning** “block” drawings. Those drawings (computer illustrations for large group sessions) are combined with comprehensive site studies to form the most appropriate phases of campus development. Once the master plan is approved by leadership, the phase one and two projects are approved for schematic design. At this stage of work the space program, phasing plan and budget are agreed upon and the architect is engaged to begin schematic design (SD).

Master Planning (MP) Process and Methods

Space Listings and Budgets

2.2-3.4 AIA 2014		Diagnostic Imaging Services		Main Hospital; Use for all sizes		Total NSF		AIA 2006		Comments (2014 Guidelines)	
Space Designation	No. of Rooms	NSF/Room	Total NSF	AIA 2006	Chap. 2.1						
2.2-3.4.6.1	Reception/Registration/Clerical					0	55.8.1				
	Workstations	0 @ 50 SF									
	Work Counter	1 @ 0 SF									
2.2-3.4.8.1	Waiting Room		1	60	60	5.5.10.1	Allow 3 seats per diagnostic room				
	Seats	0 @ 15 SF						Optional; size varies			
	Pediatric Play Area	1 @ 60 SF						Optional; depends on availability in nearby locations			
	Telephone Alcove	1 @ 10 SF						Allow 10SF/WC & 25SF/Stretcher			
	Stretcher/WC Alcove	1 @ 35 SF									
2.2-3.4.8.2	Public Toilet, Male		1	60	60	5.5.10.2	May omit if available nearby and convenient to waiting				
	Entry Vestibule	1 @ 30 SF						Optional; minimum size varies			
	Handwash Lavatory	0 @ 20 SF						Variable			
	Urinal	0 @ 15 SF						Variable			
	Toilet Stall, ADA	1 @ 30 SF						Optional; depends on availability in nearby locations			
	Toilet Stall	0 @ 15 SF						Variable			
2.2-3.4.8.2	Public Toilet, Female		1	60	60	5.5.10.2	May omit if available nearby and convenient to waiting				
	Entry Vestibule	1 @ 30 SF						Optional; minimum size varies			
	Handwash Lavatory	0 @ 20 SF						Variable			
	Toilet Stall, ADA	1 @ 30 SF						Optional; depends on availability in nearby locations			
	Toilet Stall	0 @ 15 SF						Variable			
	Interview/Consultation Room		0	100	0			Optional			
	Transcription		1	0	0			Varies			
	Trans/Dict Station	0 @ 50 SF									
2.2-3.4.8.3	Patient Staging Area		1	25	25	5.5.10.3	one per changing booth; optional separate M&F areas				
	Seats	0 @ 15 SF						Allow two booths per diagnostic room; adjust for other changing areas (e.g.)			
	Wheelchairs	1 @ 20 SF						One minimum			
2.2-3.4.8.3	Dressing Cubicles, Standard	0 @ 15 SF						Allow two per change booth			
2.2-3.4.8.3	Dressing Cubicles, HC	0 @ 30 SF									
2.2-3.4.8.3	Lockers, 1/2 Size	0 @ 3 SF									
	Circ w/in Rm	= 5 SF									
2.2-3.4.3.1	Radi/Chest w/control		0	195	0	5.5.4.1	size varies 195-220SF; based on GE				
2.2-3.4.3.1	Radi/Gen. w/control		0	265	0	5.5.4.1	Based on GE; incl. handwash station per 2.2-3.4.3.5				
2.2-3.4.3.2	Radi/Tomo. w/control		0	265	0	5.5.4.1	Based on GE; incl. handwash station per 2.2-3.4.3.5				
2.2-3.4.3.2	Radi/Flour w/control		0	340	0	5.5.4.1	size varies 295-340SF; based on GE; incl. handwash station per 2.2-3.4.3				
2.2-3.4.3.2	Toilet, Patient		0	50	0	5.5.4.2(1)	Off R/T & R/F Rooms; one per two R/F Rooms; doors to R/T&R/F Room a				
2.2-3.4.6.14	Contrast Media Prep Room		1	40	40	5.5.8.9	40SF min; size varies; incl. sink/counter/storage; may omit if pre-prepare				
2.2-3.4.6.11	Soil Hold/Clean-Up Room		1	30	30	5.5.8.10	incl. service sink/floor recept.				
2.2-3.4.6.4	Stretcher Hold, Inpatient		1	0	0	5.5.8.5	Varies				
2.2-3.4.6.6	Supervisor Office/Cubicle	0 @ 60 SF	1	60	60	5.5.8.6	Optional 60-100SF; depends on functional program				

CAH Rural Budget Test For Medical/Prof Building Early Phase Budget for Discussions Only

Preliminary Order of Magnitude

PROJECT BUDGET ANALYSIS FORM FOR DISCUSSION

First Test for Discussion

Category of Cost	Area/Unit	Cost per SF	Sub-Total	Remarks
A. New Construction	20,000	\$190	\$3,800,000.00	Cost/SF from Contractor on High Side
Heavy Renovation			\$0.00	Steel Frame Construction
Medium Renovation			\$0.00	
Light Renovation			\$0.00	
Other				
B. Fixed HVAC/EI Equip	(Allowance All New)	N/A	N/A	
C. Site Development/Preparation			\$200,000.00	\$250,000 per acre plus paving and lighting and signage
Site Development/Signage	(Allowance)	N/A		
D. CONSTRUCTION COST (SUM of A-C)			\$4,000,000.00	Requires Verification W/Contractor
E. Professional Fees				
Architect/Engineer	(Assume 6% x D)		\$240,000.00	Range 7%-12% depending on SF
Interior Designer	(Assume 1% x D)		\$40,000.00	Assume 1% for Discussions
CM Fee/Costs	(Assume 3% x D)		\$0.00	Optional; Verify Need
F. Furnishings & Furniture	(Assume 4% x D)		\$160,000.00	Early Estimate For Budgeting Only
G. Moveable/Fixed Equipment	(Assume 30% x D)		\$0.00	Allowance for Budgeting Only
Communications Equip.	(Assume 2% x D)		\$80,000.00	
H. Administrative Costs	(Assume 1% x D)		\$40,000.00	Permits, Legal and Admin. Support
I. Contingency	(Assume 5% x D)		\$200,000.00	Assumes No Complications At Site
J. Land Costs For Project	(Separate Budget)		\$0.00	By Owner
K. Inflation To Mid Point	(Separate Budget)		\$80,000.00	Assume 3 Years (1.5 Yrs. Inflation @ 3%)
TOTAL ESTIMATED BUDGET			\$4,840,000.00	Budget For Discussion
(Line "D" plus "E" - "K")				

Space Projections
Linked to Budget

General Notes:

- 1) N/A = Not Applicable At This Time.
- 2) Assumptions Will Require A/E and Owner Verification During Basic Design Services Phase.
- 3) Construction Cost Line "A" Does Not Include Inflation...Add To Budget Once Schedule Is Verified.
- 4) Cost per SF Based On Regional Trends and Comparative Building Types.
- 5) Professional Fees Will Be Negotiated...Percentage May Vary.

Building Range __\$4.8 M__ to __\$5.0M__ +/-

Master Planning (MP) Process and Methods

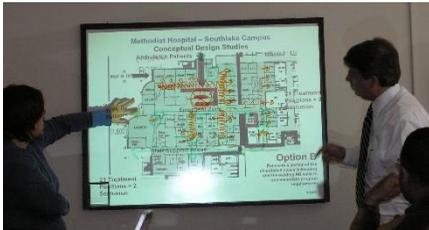
Master Zoning and Preliminary Schematic Design (SD)

(Continued)

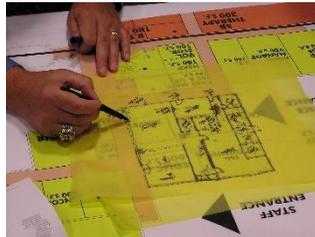
The use of **Onuma** “Cloud” technology to interface site plans with aerial views and building footprints (satellite Google Earth images are invaluable in the early site planning phases of a project). This “site development as-is product”, clear visual images, and “integrated planning approach” is a major graphic tool for group discussions, space comparisons, site evaluations, and expedient decision making. Some use the term **Building Information Modeling (BIM)** as one reference.

In the past, we’ve found, the most successful projects involve both the architectural and the engineering firms working together from the very beginning of the master planning process. The synergy and creative aspects of this working relationship produces the optimum balance of design, management, and technology.

When the partnership begins early in the development phase, all parties can share expertise, provide balance and input as the questions arise. We feel this “checks and balances” reduces the risk of over-building or under-sizing areas. We believe the MP should be objective from the onset, our MP concept is “**brains before construction bricks and mortar**”. On many of our projects, we’ve worked closely with the funding agencies and Financial Advisors to assist with the funding package, pricing documents, and related **Certificate of Need (CON)** filings that are required by several states around the USA.



Process Methods



Vision Is About The Many “Lessons In Looking And Learning” ...Each Client Is Unique



Campus Site Planning

The comprehensive site plan is a key component of the master planning engagement including, for example;

- Which site is the preferred location and why;
 - Growth, access, long term return on investment
 - Utilities and support systems short term and long term
 - Neighborhood and accessibility for customers
 - Collaboration with the City/County on TIF districts
 - EPA site surveys, civil engineering and topography
- Assessment of the existing site conditions;
 - Parking and traffic flow
 - Building access and arrangement
 - Site lighting and security factors
 - Compliance with ADA standards
 - User and staff concerns and needs
 - Public transit and vehicular access
- Growth zones and site amenities;
 - Views and vistas
 - Neighboring properties
 - Land acquisition over time

Qualifications

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Master Planning (MP) Process and Methods

Campus Site Planning (Continued)

- Landscape Considerations;
 - Existing landscape and site vegetation
 - Opportunities for expansion and/or improvement
 - Budgetary factors impacting growth
 - Health, wellness, recreation and amenities
- Site signage and wayfinding systems;
 - Issues to consider related to present conditions
 - Linkages to all campus buildings and nodes of activity
 - Branding and image strategy
- Proper site zoning and future developments;
 - Logical growth spines or corridors
 - Structured parking considerations
 - Medical/professional office space
 - Clear, direct flow patterns for
 - pedestrians, services, staff and emergency
 - Helipad and/or Heliport locations
 - Mobile technology and parking locations
 - Fire truck and service access
- Engineering and Infrastructure;
 - Utility routing and expansion issues
 - Utility costs and energy conservation issues
 - Construction phasing and long term developments
 - Maintenance and engineering upgrades
 - Capacity and infrastructure upgrades over time...maximize flexibility

Other site considerations may be added during MP/programming discussions. Typically the list of issues is compiled and addressed in stages by appropriate team members. Our team members, in tandem with the preferred architect and engineer, have experience in this area and would be expected to address all parking and landscape needs early in the process. This analysis applies to the engineering infrastructure of the buildings themselves. Too often, existing engineering systems and construction phasing issues are overlooked resulting in major cost over-runs during the design phase of work. Reliable research and decisions at the on-set save significant

capital dollars down the road. This austere environment we are currently facing mandates a **SUSTAINABLE** and manageable built environment. We would anticipate, at a minimum, an energy inventory and existing condition environmental assessment would be conducted.

All aspects of design, construction and operations must work in harmony to produce what is needed and in the most appropriate built environment. A sensitive balance of OWNER, planner, architect, engineer and builder is mandatory! In some cases, our team has arranged to organize an Integrated Project Delivery (IPD) team with a “single source contract” agreement. This works well when the project is structured to expedite the decision making process and work holistically as a unified team. All capital budget issues must be based on sound business practices and sensitive system-wide master planning.

Master Zoning or Gaming of Service Areas (DGSF Blocks)

The blocks of space which are programmed for master planning purposes are referred to as departmental gross square footages (DGSF). These DGSF blocks are zoned throughout the campus to most appropriately locate functions and services (incremental moves over time often negatively impact function). This master zoning (MZ) process is referred to as “gaming” which simply means the client and the planner “collaboratively” make these planning decisions in a relaxed and openly candid atmosphere. It is important to understand that the end product must take into consideration; realistic project budget limitations, phasing and staging concerns, disruption during construction and functional integrity of the total campus. This process works well for back-fill studies and programs involving both new construction and staged renovation programs.

The various departmental moves will likely result in some renovation to existing space, some relocation of existing services, and the possible construction of new space on the campus. In today’s “excess capacity” environment, we have suggested demolition of older buildings that may have reached their useful life expectancy (may not apply in every situation). In other cases the planners may recommend moving select services off site into more appropriate community settings (buy,

Master Planning (MP) Process and Methods

lease or develop new properties in “joint venture” with others).
Examples of “build new versus renovate” can be provided for a number of Ehc projects.

Changing Programs Provide Opportunities For Process Improvements



Process Methods

Systemwide and Areawide Issues (Continued)

In recent master planning studies (mentioned earlier herein), we have prepared project proformas to illustrate the comparative revenue and expense factors over time to demonstrate “break even” and profitability given select development scenarios. This type of “scenario planning” has proven invaluable in the current healthcare marketplace which has been somewhat unstable in recent years. The use of “off campus” options is common place in today’s diverse and challenging healthcare delivery system.

More clients are **building satellite clinics** and they are collaborating with others on multi-hospital system ventures (health parks seem to be growing in demand with the **potential impact of ACO’s** and reimbursement “bundling” being implemented nationally). Several EHC clients have purchased facilities from others and are now consolidating and re-planning functional elements within their service delivery networks.

Excess capacity remains a major issue within the industry. All new hospitals will move toward “all private rooms” and we’re seeing a number of new design trends to reduce staffing demands, improve flow patterns, and streamline functions to improve the efficiency of operations. The 2018 Hospital Design Guidelines are a key factor in the overall patient handling and movement systems (PHAMA) as well space sizes and functional considerations within programming and design.

When complete, the comprehensive campus master plan and/or area-wide needs analysis reflects the most appropriate vision and dreams of all participants without the “biased” expectations of a few. Our collective goal would be arriving at master planning decisions achieved through consensus with optimum participation of leadership. This process has worked successfully to facilitate politically sensitive planning decisions, reach closure on design directions and empower staff to take an ownership position in the final outcomes. We have extensive examples of project developments illustrating methods and outcomes that have been achieved using this methodology.

Qualifications

Master Planning (MP) Process and Methods

System-wide and Area-wide Issues (Continued)

In addition to the campus-based issues, we have participated in several areawide studies in tandem with municipal governments to determine the appropriate “fit” of healthcare programs within the urban plan. How do satellite programs relate to residential neighborhoods, public housing, commercial and industrial developments? In addition, studies have been conducted in Texas, Ohio, Georgia and Kansas to involve the university and other healthcare providers in the planning of new hospital “greenfield” developments. This combination of public/private/community partnership tends to keep all parties informed while building “bridges” to future, improved care management methods, and service delivery. For states that still develop comprehensive statewide plans, the advent of the CHNA will be less stressful although the need to work within the community to “fill the service gaps” remains a priority...particularly in the era of “population health” and the move toward wellness and early awareness.

Estimated Project Costs/Budgeting and Phasing

Project budgets are developed in tandem with the room-by-room space listings. Budgets are automatically updated as square foot areas and costs are modified. The typical project budget includes the costs for fixed equipment, site development, moveable equipment, professional fees, communications, administrative costs, inflation and contingencies as may be required. Each budget master plan tabulation is tailored to the local conditions and verified with the project architect/engineer (A/E) and preferred contractor or construction manager. Capital budgets are designed to reflect new construction dollars, three levels of renovation (light, medium, heavy), demolition and rental “build out” costs as may be required. This process takes the mystery out of pricing. We are also working with Construction Managers (CM) and Construction Managers at Risk (CMAR) to further enhance team partnering and early pricing of projects.

These partners will generate what is referred to as Guaranteed Maximum Prices (GMP) by phase or a single GMP for the entire project. This permits early start by “package or phase” and saves time, which represents real dollars in savings! Unlike budgets of the past, the Ehc methodology permits frequent and expedient adjustments of costs throughout the planning process. Pricing of projects will continue to be a challenge for healthcare providers.

Our goal is to produce a master plan product and budget that reduces the risk of surprises at bid date. Interactive technology permits this approach without loss of time and energy or unnecessary delays. We also develop very tight production budgets from the initial MP phase through design and into occupancy. These key milestones are supplied for the CON and updated as the Basic A/E Services phase begins.

Medical Equipment, Furnishings, Furniture and Wayfinding Systems and Signage Programs

One key component of the MP is the equipment and furnishings element. Far too often, this item is ignored until the design is complete or even closer to grand opening day. This can create **major operational and management anxiety** due to the financial impact of these unrealized costs. The medical equipment (fixed and moveable) alone can amount to as much as 50% of the total project budget.

With this factor in mind, we encourage our clients to address this item early in the planning process. We typically list equipment items in the space listing making the cost tabulations rather simple from the on set. In new construction, this service is most relevant due to the assessments required to determine what “stays and what goes”. The staging of upgrades and the replacement of equipment should not be a complex or awkward process if handled in the most appropriate manner and at the best time.

Medical Equipment, Furnishings, Furniture and Wayfinding Systems (Continued)

The furnishings and furniture items are often addressed generally in the programming phase and in more detail at schematic design (SD) and design development (DD) phases of basic architectural services. We invite the architect to assist in this area early in the programming cycle to keep the programmers on track with the space requirements as they define a preferred design direction or concept. The types of seating, general furnishings, beds, chairs and tables alone can have a significant impact on the space projections. As the team discusses alternative space configurations, the computerized space programs are adjusted to meet the "best possible" arrangements. Once tested against the budget and approved all can feel comfortable the end product meets the client's expectations and budget.

We also address the Wayfinding issues that relate to circulation, signage, graphics and milestones that one might look for while traveling into and throughout the hospital campus. In today's larger hospitals finding ones way from the front door to the ultimate destination can be negatively impacted by corridors, elevator access, signage and visual cues that are not well thought out our designed effectively. We work with the staff to determine the best nomenclature, sign types, sign locations and concepts that work best for optimum visual communications. Lighting, sculpture, art and various design features help with the process and eventually come together to form the complete Wayfinding master plan. This should include both exterior and interior needs and would ideally tie into the overall landscaping.



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Step By Step Process For Master Planning

TASK 1: PROJECT ORGANIZATION AND DATA COLLECTION START UP

To confirm the program and service scope identified for the client and develop a Project Work Plan for the duration of the project. Team members and assignments will be made in tandem with the project manager and architect. The full scope of effort, tasks, time frames and key decision points will be verified including owner expectations.

TASK 2: ANALYZE ARCHITECTURAL AND ENGINEERING CONDITIONS ASSIMILATE WORK LOADS AND PROJECTED CHANGES OVER TIME

To verify the degree of change required and evaluate overall interior and exterior building character. Facts concerning the buildings and the site will be recorded photographically and potential "zones of change" identified. Engineering systems (HVAC) will often impact up to 40% of the total development costs. As-is plans will be compiled and existing areas sized plus historical work loads and clinical volumes determined by service line.

TASK 3: SITUATION ASSESSMENT, STRATEGIC PLAN, AND ENVIRONMENTAL PROFILE

To integrate the perceptions of the board of directors, medical staff, senior management, and departmental managers into the campus planning process (SP + FP). To carefully link the situation to the hospital's mission and vision. Physician involvement and input is key to

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consensus building and decision making. To assess the urban planning and community factors related to market share and need...risks and rewards are evaluated carefully. To conduct departmental interviews and give each director and service line leader an opportunity to voice goals, objectives, issues and concerns (build consensus).

TASK 4: ROOM-BY-ROOM SPACE ALLOCATION PROGRAM AND DGSF SUMMARY

To identify the precise room-by-room and departmental gross square feet (DGSF) requirements for each service requiring replacement, relocation or expansion in place. All department leaders and staff that will be impacted by the facility changes will be interviewed to determine existing conditions and projected needs. Each room is analyzed to define workstations, functional attributes, equipment and furnishings.

TASK 5: MASTER FACILITY PLAN/BUILDING ZONING

To develop an Architectural Master Zoning diagram of "Block Studies" which illustrate the zoning of each floor of the building or buildings. Ehc would work with the staff and architect to finalize this document. Creativity is a must, with Ehc providing leadership as this key aspect of the master planning process evolves. Discussions with staff and physicians often occur at this phase to "test ideas and concepts" prior to final approval.

TASK 6: DEVELOP A MASTER SITE PLAN

To develop a Master Site Plan of existing and proposed buildings. Growth concepts, departmental expansion opportunities and major long range development factors

will be illustrated plus the most appropriate and affordable staging and phasing.

TASK 7: TOTAL PROJECT BUDGET AND EQUIPMENT FACTORS

To develop a preliminary project budget for planning and phasing purposes. This budget is tested with the architect/engineer/CM and team leadership for ROI and affordability.

TASK 8: PRELIMINARY STAFF REVIEW OF MASTER FACILITY PLAN (Often Community Meetings, Public Forums and Clinical Discussions Occur During this Phase of Activity)

TASK 9: FINAL PRESENTATION TO THE BOARD OF DIRECTORS

TASK 10: FINAL REPORTS AND PREPARATION OF REGULATORY REVIEW DOCUMENTS



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Master Planning Time Frames For Consideration

To conduct the ten tasks illustrated above we typically require 12 to 15 weeks, contingent upon scope of effort. The time frame can be reduced should the owner desire a "faster production" schedule. The negative aspects of an expedited MP process is the lack of staff input and time for orderly decision making. Quite often, we find the production can occur rather quickly, but time for staff dialogue and Board/Medical Staff discussions is less expedient.

Week One/Two	Prepare and Distribute Questionnaires to Department Directors Forward to Staff (W/Explanation) for Distribution
Week Three	Series One Interviews and Building Evaluation Prepare Work Load Analysis and Projections Director Interviews and Survey of Existing Conditions
Week Four/Five	Complete Arch/Engineer (A/E) Assessment of Site/Building Systems Complete Management Information Systems Study (Optional) Complete Equipment Assessment (Group I, II, III) (Optional)
Week Six	Complete Space Analysis and Room By Room Listing Complete Physician Issues and Productivity Assessment Compare Space to Productivity and Return on Investment (ROI)
Week Seven	Conduct Second Series of Interviews Confirm Priorities Based on ROI and Demand Analysis Test ROI and Cost Implications With Leadership

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Test Budget Alternatives and Phasing Options
Consider Site Plan and Campus Related Factors
Consider Community Awareness and Promotional Sessions

Week Eight

Test Departmental Concepts and Internal Relationships
Test Site Plan and Options Against Program
Look At Off Campus Options (New vs. Renovation) Where Appropriate

Week Nine

Conduct Final Series of Interviews
Prepare Master Plan and Zoning Options
Promote Project To Community Leaders and Present Design Concepts

Week Ten

Finalize All Space Program and Budget Options
Finalize Site Plan With A/E/C Input
Test Project Delivery Options (Type of Contract and Action Steps)

Week Eleven

Coordinate A/E/Systems Strategy
Prepare Board Presentation and Budget Ranges

Week Twelve

Forward Board Presentation To Staff
Test Options and Prepare Final Board Packets W/Illustrations

Week Fourteen

Present to Board of Directors Or Senior Decision Making Body
Finalize Report and Leadership Observations With Suggestions
Forward to Staff and Determine Next Steps...Phase 1 Start Up As Appropriate

Week Fifteen

Prepare Follow Up Presentations for Key Leaders, Community (As Required)

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Planning is a Participatory Process

Programmatic Data and Trends

Ehc manages an electronic library and computerized data base of all space standards for major medical centers and acute care hospitals including graphic modeling techniques designed to respond to the current planning and architectural design standards used throughout the USA. All space programs meet standards outlined by the TJC (JCAHO), DHHS, CORF licensure and the FGI *Design Guidelines for Hospitals and Related Facilities – 2018 Edition*. Many states still use the 2014 edition.

Space projections must meet functional expectations, but should not be resource wasteful or inefficient. The need to “re-engineer or re-align” spaces in healthcare to meet product line and clinical profiles is paramount. By placing functions of “common linkages” near each other, labor, time and customer accessibility is improved. Ehc has recently completed a number of re-engineered space planning projects (existing facilities and new replacement programs) that represent the following;

- **Free Standing Specialty Center Alternatives;**
 - Free standing cancer care for children and adults
 - Health Parks and Integrative Medicine programs
 - Senior care housing and assisted living (CCRC campuses)
 - Consolidated surgery services vs. decentralization
 - Joint ownership and physician partnership options and alternatives
 - Medical Office Building (MOB) developments and retrofits
 - Free standing Emergency Departments (FSED)
- **Renovation Versus New Construction Alternatives;**
 - Engineering, energy and maintenance factors
 - Life/cycle and functional benefits

- Long term ROI and expansion considerations
- Down-sizing and decentralization concepts
- **Campus-wide evaluation of all healthcare services;**
 - Conversion of acute care beds to other categories (down-size and consolidate)
 - Conversion from acute to observation and short stay bed developments
 - Preparation of on-site and off-site ambulatory surgery care beds
 - Planning for step down and sub acute care programs
 - Linkages to acute care and same day outpatient needs on and off site
 - Development of on-site and off-site outpatient rehab. services
 - Evaluation of psychiatry and mental health related inpatient bed programs
 - Consideration for family stay, family-focused and “Planetree” bed programs
- **Establish convenient entry, registration and outpatient areas**
- **Consolidated of pre-admissions testing and re-design of flow patterns**
- **Improved ambulatory procedure and outpatient areas**
- **Improved short stay and observation bed locations, design and layout**
- **Urgent and “fast track” emergency and intervention programs;**
 - Linkages to industrial and occupational medicine
 - Linkages to PT/OT and Wellness programs
 - Observation and short stay needs
- **Medical mall or Village and related retail applications;**
 - Not for profit and for profit ventures
 - Non-hospital and commercial endeavors
 - Customer convenient and non-institutional environments
- **Off campus developments for “softer” areas;**
 - Business Office and Information Systems
 - Administrative and Executive Office Functions
 - Education and In Service Support Space
 - Outpatient Clinical and Short Stay

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All **operational shifts in bed utilization** are developed with the clinical volumes and longer term census and projected occupancy in mind. Too often, the financial impact of low census isn't considered until the program is complete and staff realize the cost-justifiability of the change. The form and function are balanced with the overall economic impact. Continuity of effort, flow and efficiency are key considerations.

Key Questions During Master Planning

Some of the key questions that we answer related to the move of any service are the following;

Should we consider the relocation of services;

- Changes in operations and staffing adjustments
- Need to improve accessibility, regionalize and consolidate
- New affinities required with budget cuts anticipated over time
- Too small now/programs growing/other programs not growing

How big should the inpatient and outpatient bed areas be in the future;

- How many beds today...does the move to outpatient require a shift in use
- Distribution of semi and private rooms...what do patients and family desire
- What does family-focused, companion-care and planetree really mean
- Isolation needs (privacy, medical necessity, etc.)
- Special exhausting and acoustical needs for patients
- ADA and handicap issues...are we in compliance or just "grandfathered"
- What about isolation and infection control, do we comply

What are the historical use trends, average daily census and length of stay factors?

What new concepts and operational factors should we consider;

- Patient and family focused care
- Just-in-time service and operational support
- Computer applications and bedside charting factors (HIS/PAC Systems)
- Planning for pharmaceutical needs (Pyxis or equivalent systems of unit dosage)
- Nurse server and sub-unit nursing support
- Staff walking times and distance to patient rooms

- Nurse call and communications systems...records and related automated systems
- Patient monitoring and telemetry needs...expectations and limitations

Should we plan for future expansion of the services and programs?

What are the budget and phasing considerations?

What is the project schedule and time lines to consider?

How do campus developments fit into the overall facility master plan;

- Do program developments meet the mission/vision expectations
- Will changes have a positive return on investment (ROI)
- What are the value-added factors for the customer(s)
- What is the value added for the physician/research/student
- What about the value added for nursing and clinical support
- Will the plan meet housekeeping and related support needs

What are the phasing options and alternatives;

- Will it be disruptive during construction
- Will there be any down-time during construction
- What do I do with my existing services in the present area
- Should we consider demolition

Who should we hire to develop the project...and when;

- Do we need to look at the equipment and furnishings
- How about the interior decor, signage/wayfinding and the lighting
- Does the existing space require engineering upgrades
- Could we get by with minimum renovations and meet JCAHO

What are the site factors to consider;

- Access, egress and parking
- Landscaping, site lighting and site signage
- Land acquisition short term and long term
- Future expansion and site development

Do we need any approvals before we start, who and how do we obtain them;

- Compliance with the strategic plan and certificate of need (CON)
- Budgetary and systemwide implications
- Bed number changes, validation and areawide/regional factors
- Life safety, fire code and TJC/JCAHO compliance and/or accreditation

Are there geotechnical and/or environmental factors to consider;

- Assess any conditions that might warrant changing the site
- Review long term viability of site for growth over time
- Assess budgetary factors (soil removal, excavation, utility access and parking over time)

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Reasons to Consider Ehc for Master Planning

We are an experienced organization with a long listing of healthcare clients to our credit (hospitals, universities, Veterans Hospitals, nursing care centers, CCRC's and numerous Assisted Living and related senior housing communities). The best judge of professional service delivery is **the active client list** and that client's assessment of the service. All of our clients to date have returned to the firm for repeat business (average of 4 engagements per client over the most recent decade). Of the listing below, all represent repeat business for a number of years.

The Tower Health System, Reading, Pennsylvania

West Reading Campus

Phoenixville Campus

Brandywine Campus

The Maury Regional Medical Center and Healthcare System, Columbia, Tennessee

The Vanderbilt University (200 + projects) and The VAMC of TN (3 locations statewide)

The CHRISTUS System of Texas, Corpus Christi and Texarkana, Texas

The Reading Hospital Medical Center and Hospital System, Reading, Pennsylvania

The Lehigh Valley System, Allentown, Pennsylvania

The Mid Columbia Medical Center, The Dalles, Oregon

The Community Mercy System, Springfield, Ohio and KY

The ProMedica System (Bay Park Hospital), Oregon, Ohio

The Harris County Hospital District, LBJ Trauma Center, Houston, Texas

The DeKalb Medical System, Decatur and Hillandale, Georgia

The Adventist System of Texas (Metroplex System), Killeen, Texas

The Shriners Orthopedic Hospitals for Children, Mexico City, Mexico and Portland, Oregon

Community Health Systems, Nationwide Programs, Franklin, Tennessee

Carthage Memorial Hospital and Nursing Home, Carthage, Illinois

Critical Access Hospitals (CAH), IL, MO, NB, IA, TN, KS, MS

Nevada Regional Medical Center, Nevada, Missouri (Quorum Managed)

The ProMedica System, Akron, OH

The CHRISTUS System, Texarkana, TX

The Mercy/Bon Secours System, Cincinnati, OH

The National Cancer Institute of Cairo, Egypt

The University of Texas Medical Branch in Galveston, TX

The North Mississippi Healthcare System, Tupelo, Mississippi

The St. Vincent's Healthcare System, Jacksonville, Florida

Valley View Hospital and Health System, Glenwood Springs, CO

Highland District Hospital, Hillsboro, Ohio

The Novant System, Charlotte, North Carolina

Ehc is **innovative, specialized and responsive** to the healthcare trends and market forces that impact the hospital environment. The leadership team offers a variety of specialty skills that go beyond the traditional facility consulting firm. The firm philosophy is a "comprehensive and collaborative" approach to building development. While working closely with the hospital staff, the consultant brings expertise that covers a broad range of operational and functional needs. The building planning and design must take into consideration many factors before "bricks and mortar" can begin. Ehc team members apply their experience and expertise to the **changing forces and trends** within the healthcare system. Ehc encourages RESEARCH as a basis for evidence-based design decisions. As the CONCEPTS evolves, so do the findings of both planner and owner. As these benchmarks are compared, new trends, ideas and technological advancements are compared and applied when appropriate.

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