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# **Practice papers**

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# Developing a replacement facility strategy: Lessons from the healthcare sector

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## Abstract

With ageing hospital facilities spanning the USA, the healthcare construction business continues to grow. Today, questions about replacing existing facilities are becoming more common in hospital boardrooms. Given the above situation, TriBrook Healthcare Consultants were recently retained to determine the market, operational and financial impact which facility redevelopment has had on other hospitals and health systems. Out of that effort came this paper. This paper assesses: the factors which are fuelling replacement facility growth; the impact that redevelopment has on market, operational and financial performance; an integrated development process to help organisations determine the feasibility of designing a new facility; and lessons learned working with clients who have pursued a replacement facility strategy. The objective of this effort is to provide hospital executives and board leaders with information that will be useful in reaching a final decision regarding execution of a replacement strategy.

## Keywords:

healthcare facility strategy, replacement hospital planning, hospital facility planning, healthcare construction, redevelopment factors, improving operations/financial performance

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## INTRODUCTION

Anyone who has been on a US hospital campus over the past few years knows that the healthcare industry is in the middle of its largest building boom since the Hill–Burton<sup>1</sup> era. Senior management teams and board members of hospitals are increasingly exploring and executing the complete replacement of their physical plants. According to Modern Healthcare's 24th Annual Construction and Design Survey, 82 new acute care hospitals were completed in 2002, with 105 more under way. In addition, an additional 152 were designed.<sup>2</sup> Many of these projects are not only replacement facilities and hospital expansions, but new construction of hospitals not in existence before. The TriBrook Healthcare Consultants practice alone has planned for over ten replacement facilities in the past two years.

### Boom in replacement hospitals

Pursuing a replacement hospital strategy has tremendous implications for healthcare providers and their constituents. While the potential upside is significant, such a strategy requires large capital resources which place enormous stakes on the success or failure of execution. In other words, current decisions will go a long way towards determining the organisation's position and ability to serve its community for decades.

## FACTORS FUELLING REDEVELOPMENT GROWTH

There are several factors which appear to be fuelling the redevelopment activity in the hospital sector.

### Growth across country

#### Population growth

Demographic growth is accelerating the expansion of healthcare facilities across the USA. Every state in the USA grew between 1990 and 2000, and the nation experienced population gains in 80 per cent of all counties.<sup>3</sup> Rapid-growth, affluent areas are experiencing intense competition to build new facilities to accommodate the growing demand for in-patient and out-patient services. In fact, for the first time since implementation of the in-patient prospective payment system (PPS) in 1984, in-patient bed capacity rose in 2001, and hospital industry analysts expect demand for hospital services to increase over the long term.

### Significant growth in older age groups

#### Ageing of the population

According to the US Census Bureau, by 2025 some 62.6 million Americans, or 18.5 per cent of the US population, will be aged 65 or over — an 80 per cent increase over 2000, when 34.8 million Americans, or 12.4 per cent of the total population, were aged 65 and up. The number of people aged 85 and older is projected to rise to 7.4 million over the same period, then more than double again by 2050, to 19.4 million. This is important because history has shown that as patients age, their use of healthcare services escalates dramatically. In fact, some analysts are predicting that, over the next 25 years, there is going to be a need for nearly 238,000 additional acute hospital beds.<sup>4</sup>

### **Baby boomers leading the consumer revolution**

#### **Consumerism**

Seventy-six million strong, the baby boom generation and its buying habits have helped drive the cost and quality revolution in industries ranging from automobile manufacturing to retailing. Now healthcare is facing a similar revolution to improve processes and quality, as consumers become more sophisticated and confident in voicing their concerns. With higher disposable income than previous generations and a willingness to pay for the best, today's baby boomers hold the key to healthcare practices in the next century.

Better educated and more medically sophisticated than their parents, they expect more in the way of medical care as they age. They consult doctors more often, second guess them more often, and choose their own medicines and therapies. They watch pharmaceutical company commercials and demand exposure to newer drugs. They read health papers and worry. Making this understanding more achievable is the internet. Even a casual surfing of the world wide web reveals a massive amount of medical data available to those not satisfied with doing what the doctor ordered. The Internet is playing an increasingly greater role as more cyberchondriacs log on to help make cost and treatment decisions. It can give consumers a sense of personal power and integrity, leaving them feeling more educated and clear about the choices they need to make.

Although boomers will begin to use health services and facilities in greater numbers over the next five years, heavy utilisation by this group is still a decade or more away. Meanwhile, they will be in and out of the health system on an increasing basis as they care for their ageing, often chronically ill parents. Today, healthcare architects are recognising the needs of patients and their families through redesign, transforming bland institutional settings into consumer-friendly facilities.

#### **Ageing infrastructure**

The Centers for Medicare and Medicaid Services project that hospital construction will grow to almost \$35bn in 2012, up from \$20bn in 2002. Construction costs are driven by several factors, one of which is deferred investment. The Center for Healthcare Industry Performance Studies reports that the average age of plant for hospitals increased nearly 15 per cent between 1992 and 2000 (from 8.2 to 9.4 average years). Many hospitals held back on renovation and expansion of their facilities during the 1990s owing to payment reductions imposed by the Balanced Budget Act (BBA) 1997 and profitability concerns. Specifically, the BBA 1997 had a disproportionately negative impact on smaller, typically not-for-profit hospitals. As a result, many not-for-profit facilities began to under-invest in their hospitals, leading to a loss of market share and diminished access to capital, which limited their flexibility to reinvest in maintaining and expanding their

### **Hospital construction growing rapidly**

facilities. In addition, many hospitals which were built with Hill–Burton grants are now more than 40 years old and in dire need of renovation. Because of site constraints and/or obstacles created by the existing physical layout, these facilities cannot be reconfigured in an economically and operationally effective manner.

### **Nursing shortage**

#### **Workforce and technology**

Labour shortages continue to plague hospitals across the country despite higher wages and increased work flexibility. The nursing workforce, which comprises the bulk of hospital employees, has been particularly hard hit. Estimates place the current vacancy rate for registered nurses (RNs) at about 13 per cent.<sup>5</sup> Based on what is known about trends in the supply of RNs and their anticipated demand, the shortage is expected to grow to 20 per cent by 2015.<sup>6</sup> Many other types of healthcare workers, such as pharmacists and imaging technicians, are also in demand. Adding to these labour concerns is the possibility of a coming physician shortage as baby-boom doctors begin to retire in large numbers. One way for hospitals to compete with physicians, imaging centres, other stand-alone facilities and other hospitals for healthcare workers is to design space which will make it easier for the workforce to continue working as they age and embrace new medical technology which will improve efficiency and safety. By creating a superior healing environment, hospitals which replace old facilities will have an easier time attracting top-notch clinicians and employees.

### **Increased market share**

#### **Market share and utilisation gains**

Hospitals which can, and do, commit substantial capital to maintaining and upgrading facilities seem to be gaining market share at the expense of competing hospitals. Market share is a closely watched indicator of market success, and financial success is closely linked to market share. Thus, it suggests that organisations can improve their market share success by making capital investment in facilities and technology. In addition, many hospitals have relocated to rapid-growth, affluent areas to build their new health facilities not only because of the socio-economic factors but also because these high growth areas typically have the availability of large tracts of land for new construction. As illustrated in the next section, replacement facilities have the potential to realise ‘leapfrog’ market share gains and expanded utilisation for the organisation.

#### **THE IMPACT OF REPLACEMENT FACILITY DEVELOPMENT ON MARKET, OPERATIONAL AND FINANCIAL PERFORMANCE**

For the purposes of this paper, a replacement hospital has been defined as an existing facility redeveloped with new construction. It does not take into account net new hospitals developed or major on-campus expansions. In order to evaluate the impact of the replacement facility strategy, TriBrook Healthcare Consultants

analysed the pre- and post-utilisation, operational and financial performance of those facilities for which secondary data are available. To evaluate the benefits of replacing an entire facility, TriBrook Healthcare Consultants sampled 29 non-military hospitals which executed a replacement strategy. Information was available for 19 of the 29 replacement hospitals which were identified. Either the remaining ten had been completed too recently to be able to evaluate the impact or information is not currently available. It should be noted that the data provided in the following figures were derived from secondary sources. Therefore, the accuracy of the data are dependent upon accurate reporting.

### **Market performance**

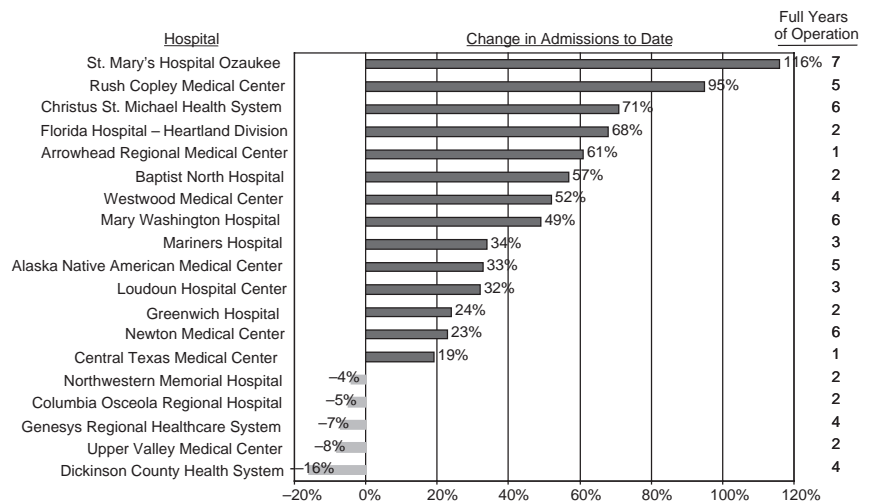
This analysis focuses on the pre- and post-replacement in-patient admission and out-patient visit volumes of the facilities analysed. For consistency, the analysis is based on secondary data derived from three sources: the American Hospital Association (AHA), HCIA (Solucient) and Hospital Benchmarks. Throughout the 1980s and 1990s, demand for greater convenience and new technologies and continued cost pressures led to a major shift in the way TriBrook Healthcare Consultants provide care in the USA, from primarily on an in-patient basis to more of an out-patient basis. Beginning in the mid-1990s, the USA started to see a small upsurge in the number of in-patient admissions.

### **Increased in-patient admissions**

TriBrook Healthcare Consultants' research on replacement facilities shows, however, that redevelopment has a profound effect on in-patient activity. Figure 1 presents the pre- and post-replacement admissions experience of the study hospitals. As the data indicate, there is a significant variation in the changes in admissions by these facilities. The change in admissions ranged from a 16 per cent decline to a 116 per cent increase. Fourteen of the 19 hospitals which reported in-patient admission data to secondary sources have experienced an increase in in-patient admissions. The median change was 37 per cent. Five of the replacement hospitals have experienced in-patient admission increases of over 60 per cent. By comparison, the annual rate of change for admissions in the US was 1.3 per cent between 1997 and 2001.<sup>7</sup>

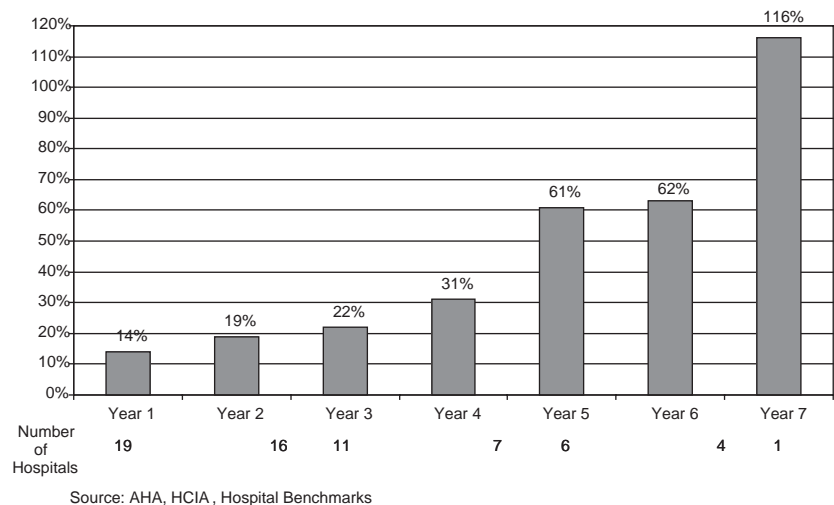
Figure 2 presents the average percentage change in in-patient activity by year. The data indicate that volumes in the first years post-replacement tend to grow from between 15 and 20 per cent during the first three years and then grow significantly thereafter. It should be noted that the number of hospitals which are used to calculate the averages declines over the years, so caution must be exercised in interpreting the results.

Overall, the above analysis indicates that most replacement hospitals experience significant growth in in-patient admission activity. Most of this growth is attributable to market share gains, as the change in population and use rates is not sufficient to explain



Source: AHA, HCIA, Hospital Benchmarks Note: Christus St. Michael data is from year 1 of operations at the new facility through most recent data.

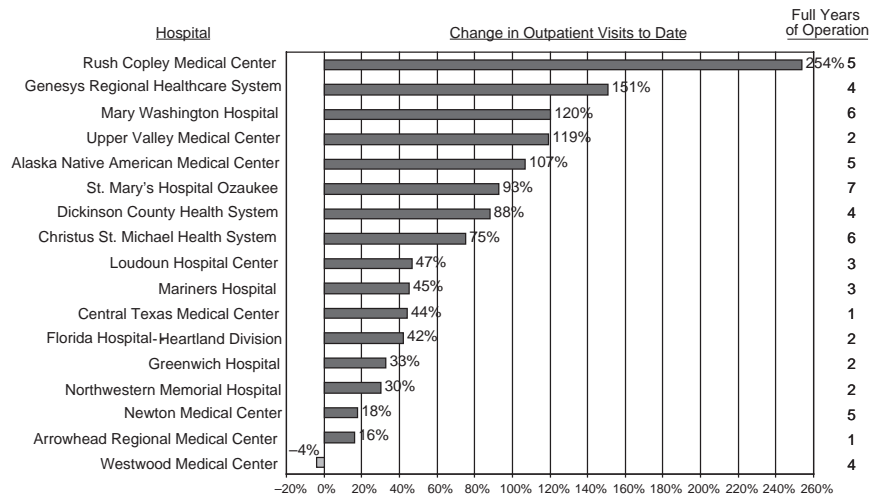
Figure 1: Change in in-patient admissions pre-replacement to most recent data



Source: AHA, HCIA, Hospital Benchmarks

Figure 2: Change in admissions pre- to post-replacement (%)

the magnitude of increase. For planning purposes, a five-year increase of 30–40 per cent would appear to be a reasonable estimate of the impact of a new facility in most situations. Even though this estimate is less than the 61 per cent that TriBrook Healthcare Consultants saw in this sample, it still is significantly higher than the 7 per cent increase for in-patient admissions which was seen in the USA between 1997 and 2001.<sup>8</sup> The estimates would need to be refined, based on the unique characteristics of each market. These estimates also should be refined as time goes on and extended as longitudinal data on recent replacement hospitals become more



Source: AHA, HCIA, Hospital Benchmarks

Note: Christus St. Michael data is from year 1 of operations at the new facility through most recent data.

Figure 3: Change in out-patient visits pre-replacement to most recent data

available and as other replacement facilities are identified or developed.

Figure 3 presents the pre- and post-replacement out-patient visit experience of the study hospitals. As with the in-patient data, there is significant variation in the changes in out-patient utilisation experienced by these facilities. Sixteen of the seventeen replacement facilities experienced growth in out-patient visits with a range of -4 per cent to 254 per cent. The median growth in out-patient visits is 75 per cent. Five of the hospitals doubled their out-patient visit volumes. By comparison, the average annual growth rate for out-patient visits between 1997 and 2001 was about 4 per cent in the USA.<sup>9</sup>

Figure 4 presents the average percentage change in out-patient visits by year. As with the in-patient volumes, out-patient growth rates rise significantly during the first three years and then explode after year four. Again, it should be noted that the number of hospitals which are used to calculate the averages declines over the years, so caution must be exercised in interpreting the results.

In general, the analysis indicates that most replacement hospitals experience high levels of out-patient utilisation growth. The fact that the growth in out-patient activity tends to be higher than in-patient growth might be explained by a disproportionate ability to improve ambulatory services provision in a new facility. While it can be argued, based on history, that five-year out-patient growth rates of 70-80 per cent should be used to project out-patient visit utilisation, given the increase in competition from physician offices and other stand-alone facilities, a 40-50 per cent growth rate is likely to be more realistic. This growth rate is still significantly higher than the 21 per cent increase which was seen in total out-patient visits in the USA between 1997 and 2001.<sup>10</sup>

**Increased out-patient visits**

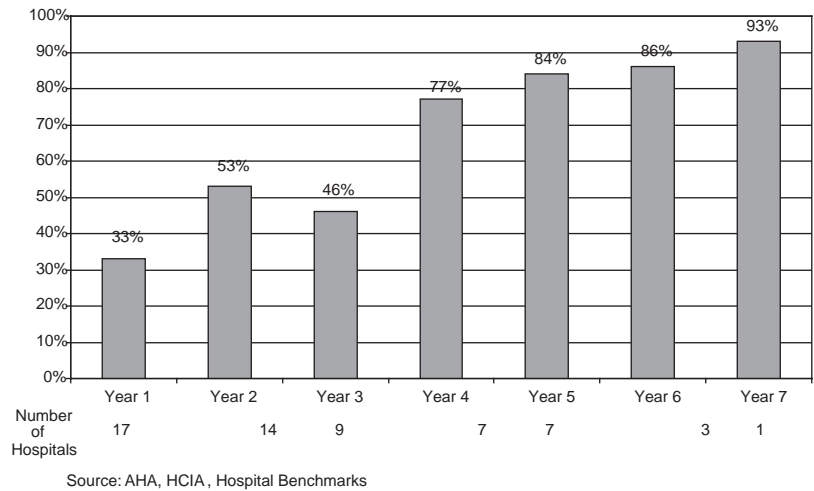


Figure 4: Change in out-patient visits pre- to post-replacement (%)

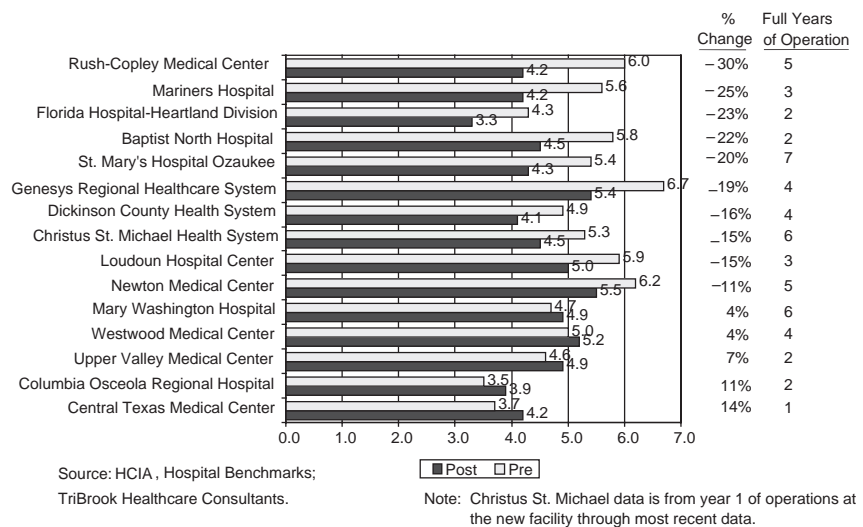


Figure 5: Pre- and post-redevelopment staffing patterns FTEs per AOB

### Operational performance

While the operational and financial impact of redevelopment has been positive overall, there is greater variation in the experience than with the impact on utilisation. The following summarises changes in pre- to post-redevelopment performance associated with staffing levels as measured by full-time equivalents (FTEs) per adjusted occupied bed (AOB). Because salary and benefits comprise over 50 per cent of a hospital's budget, FTEs per AOB is a key indicator of how productive a workforce is for a facility. Figure 5 presents the pre- and post-redevelopment staffing levels of replacement hospitals.

Most of the study hospitals have experienced a reduction in

**Decrease in the number of employees per bed**

FTEs per AOB since the facilities have been replaced. The overall average from pre-opening to post-opening declined from 5.2 to 4.5 FTEs per AOB, or about 12 per cent. It should be noted, however, that this average was based upon variable years of operation for the study hospitals. This is in comparison with the national average of 4.9 FTEs per AOB in 2001.<sup>11</sup> Effective process design, right sizing of patient care units and effective architectural planning can be credited for the operating improvements created. It is important to note that in many cases the raw number of FTEs actually increased at these facilities, but these increases were more than offset by volume growth. It is also important to note that many factors influence staffing patterns, such as hospital size, geographic location, occupancy rate, teaching status, case mix index and specialty mix of medical staff.

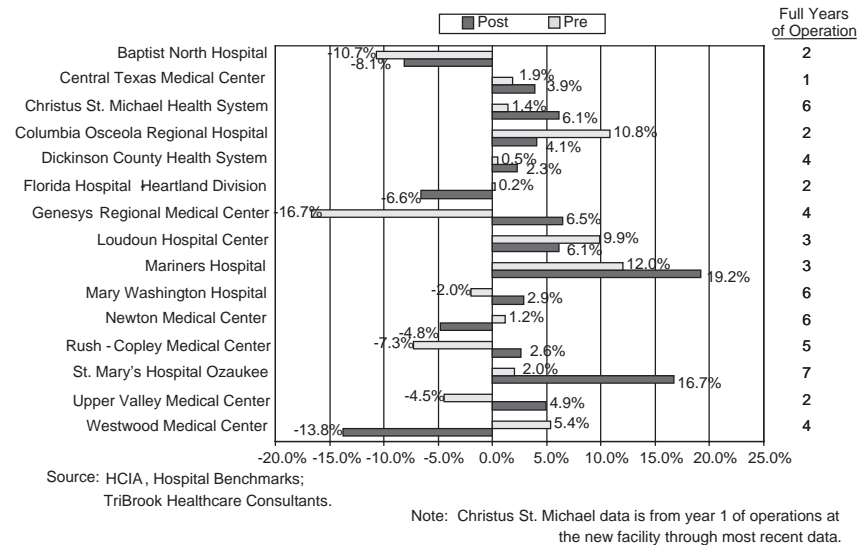
**Improved operating margins**

**Financial performance**

Given the magnitude of investment associated with redevelopment, it is obviously important to analyse the impact of this strategy on profitability. Figure 6 presents changes in the operating margin from pre- and post-redevelopment. Overall, redevelopment has had a positive impact on the profitability levels of most study hospitals. Of the 15 hospitals which provided data, ten improved their operating margin. The overall average from pre-opening to post-opening increased from 0.3 per cent to 2.8 per cent for operating margin percentage.

**Study limitations**

When they first started to track replacement facility activity, TriBrook Healthcare Consultants were not aware of an industry database which followed this activity. They identified the 29 non-



**Figure 6:** Pre- and post-redevelopment operating margin (%)

**Comparisons between replacement facilities are difficult**

military replacement hospitals through a combination of interviews with six major architectural firms, their own firm’s experience and research completed by AHA staff.

With regard to the information just presented, it is important to note that the sample size is not statistically significant. Also, it is very difficult to compare facilities from very different markets. Outside factors such as geographic location, outside competition, socio-economic status of the community and physician practice patterns can have a profound effect on a facilities market, operational and financial performance. Finally, it is important to note that the years of operation for the study participants differ, so comparisons are not always consistent. Even with these inconsistencies, however, it would appear that there is sufficient information to draw important conclusions about replacement facilities.

**DEVELOPMENT PROCESS, AN INTEGRATED APPROACH**

Given the potentially positive results that replacement has on performance, it is reasonable to ask what issues need to be considered in deciding whether or not to pursue such a strategy. Figure 7 summarises an integrated approach to planning a new facility.<sup>12</sup> The process emphasises the planning activities both before and after to engaging the design and construction professionals.

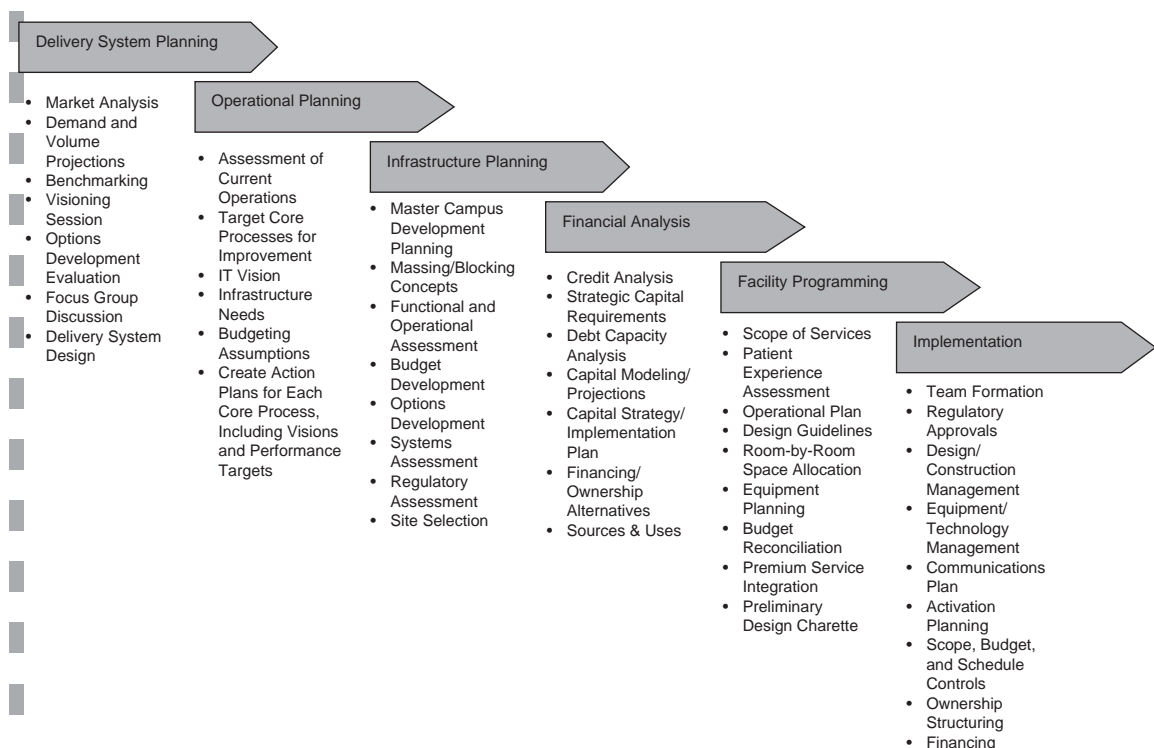


Figure 7: Integrated development planning process

## Strategic planning should drive process

### Delivery system planning

As with most major strategic decisions, the process begins with an in-depth assessment of the organisation, its mission and its environment. Strategic planning outlines the goals and vision of the institution and highlights strengths, weaknesses, threats and opportunities. It also establishes priorities for programme development, which should be the basis of physical development.

Replacement is a defining strategic initiative. Developing a sense of how the organisation's strategic position may change as a result of redevelopment is critical. It would be difficult to make a compelling case for replacement and relocation without either anticipating significant upside utilisation and/or market share growth if the strategy is executed or significant utilisation and/or market share erosion if it is not pursued.

Key questions that the organisation will need to address include:

- What is its prospective market area?
- Who are its referral sources and what are their expectations?
- Who will its competition be in the future?
- Will a replacement facility improve the quality of care?
- How will the community react to replacement?
- How will it communicate its plans?
- Where does it want to be 10 years from now?
- What are the appropriate services, service size and scope to meet market area needs?

### Operational planning

Developing a new facility provides the ultimate clean slate for operational planning. New models of service and patient care can be constructed in the absence of the limitations of existing physical resources. State-of-the-art technology can be applied, particularly information technology, which can change the mix of human and other resources required to provide service. Employee satisfaction surveys suggest that those who work in new facilities are generally happier with their employment situation. This suggests a greater ability to recruit and retain scarce human resources. Replacement facilities also provide the potential to present a different kind of environment in which to deliver care.

As with the market issues, the operational considerations must address the economic equation — in this case, the focus is on the cost of care. A fundamental question is whether or not a new facility will provide the opportunity to reduce unit service costs. If it does not, the case for revenue growth has to be that much more dramatic.

Key questions that the organisation will need to address include:

- What operating model will be used in the new facility?
- What improvements should be targeted in the new facility related to service, quality and efficiency?

## Planning for improved care delivery

- Will a new facility provide the opportunity to reduce unit service costs?
- Does it have a long-term IT plan?
- What are the opportunities for change and how will technology enable these changes?
- What is the investment required to execute the long-term IT plan?

### **Define development concept**

#### **Infrastructure planning**

During the infrastructure planning phase, the organisation establishes the development concept, development priorities and potential phasing of that development as well as potential constraints (political, regulatory and competitive). During this phase, the anticipated activity/volumes and operational concepts are translated into departmental gross square footage (DGSF) space allocations, potential sites are evaluated, a master site and facility plan is developed, and preliminary capital investment requirements for the development concept are prepared.

Key questions that the organisation will need to address include:

- What are the expansion possibilities of the existing campus?
- What is the land availability in the market?
- How much land is really needed?
- How much space is required for departments and services?
- What physical and functional relationships are indicated by the operating model?
- Do we build for 50-year use or 25-year use?
- Is there a sound usage or disposition strategy for the old physical plant?
- What potential obstacles could influence the implementation?

### **Project costs range from \$0.9–1.3m per bed**

#### **Financial analysis**

For even the smallest replacement facility projects, the cost of executing the strategy is tremendous. Industry averages for recently completed projects vary dramatically depending on the scope of the project; site development, level of finishes, services and programmes, operating concepts applied and so on, but they are typically in the range of \$0.9–1.3m per bed. The ability to fund replacement projects therefore requires deep financial resources or access to capital.

### **Determine debt capacity**

An evaluation of the organisation's financial operations must be conducted to determine its debt capacity. A preliminary feasibility study should be performed early in the project, based on major assumptions regarding construction costs, other project costs (professional fees, permits, site development, equipment and furnishing etc), utilisation and interest rates so that the project scope can be adjusted as necessary. The final feasibility study is performed after receipt of construction bids and is based on actual interest rates at the time of financing. Many organisations

determine that it is not feasible to proceed alone and need to seek partners or consider phasing the implementation.

Key questions that the organisation will need to address include:

- Does it have the capital to fund a replacement project?
- Is it willing/able to assume higher levels of debt?
- Does it need to consider partnering with others to provide the means of replacing a new facility?
- What is the potential return on investment?
- When does it execute the strategy?
- Does it phase?

### **Facility programming**

Once the scope of the project is defined, a functional space programme which describes in detail the space requirements for each department included in the proposed project can be prepared. The functional space programme describes present and future activities, outlines operational concepts, reviews historical and projects future utilisation and staffing, outlines room by room space needs, identifies major proximity requirements and conceptually illustrates departmental and intradepartmental organisation of space.

The programming phase provides an opportunity to consider new organisational and operational approaches to enhance the patient experience and improve operational efficiencies. During this phase, the IT vision, medical technology and building system budgets are tested at a conceptual level.

Key questions that the organisation will need to address include:

- How much space is required to support the vision?
- How does it maximise operating efficiencies through planning and design?
- How will future flexibility be achieved?
- Should excess capacity and/or shelved space be incorporated into some areas?
- What medical equipment will be required? Will specific equipment impact room sizes?
- What medical equipment and furnishings will be relocated?

### **Implementation**

During implementation, the actual design and construction is completed. Key steps include team formation, regulatory approval, equipment/technology procurement, financing and project management. An activity often overlooked is communication planning. Everyone — including employees, physicians and the community — is interested in how the project is proceeding.

Additionally, thorough planning is necessary for the smooth opening and activation of the new facility. This planning includes development of operational systems, determination of staffing levels

**Functional space programme**

**Communication is the key**

and staff recruitment plans and definition of relocation strategies. Equipment installation schedules and development of a building activation schedule all occur during this phase too.

Key questions that the organisation will need to address include:

- How does it maintain project scope, budget and schedule?
- How will deviations/change orders be handled?
- What regulatory approvals could impact timing?
- When should various furniture and equipment be ordered?
- How does it ensure a seamless transition from current to new facility?

## **CONCLUSIONS**

The evidence suggests that the impact of facility replacement on market, operational and financial performance can be dramatic. At the same time the costs and risks are substantial. If indeed the trend toward replacement continues to accelerate, it may become even more prevalent as hospitals/health systems are forced to keep up with their competition.

While limited in number, TriBrook Healthcare Consultants' client experience clearly demonstrates the need for careful site selection, operational planning and facilities design. The more successful organisations developed on or very near to major transport corridors and in close proximity to areas of population growth. They also developed a facilities plan that accommodated more efficient staffing patterns. It is interesting to note that the successful organisations also relocated all services to the new campus rather than attempting to maintain even a limited scope of operation at their old sites.

To those organisations considering a replacement facility strategy, the following lessons are offered:

### **Lessons learned**

- Identify and study the options carefully and objectively, because this will be a defining strategy for the organisation. At the same time, avoid extending the decision-making time frame; otherwise, the community, physicians, customers, employees and others will become frustrated and aggravated by the indecision.
- Keep the interests of the community and the market at the centre of the evaluation.
- Avoid undersizing the replacement facility. The majority of replacement facilities developed have exceeded their utilisation projections.
- Move everything out of the old facility or at the least be able to present a very strong case for keeping programmes and services at the existing site.
- Be sure to allow sufficient time for staff integration and training at the new facility, especially if consolidating staffs from multiple sites.
- Take full advantage of the opportunity to redesign patient care, but avoid radical, untested concepts.

- Do not under-invest in infrastructure for the sake of ‘value engineering’ and do not over-invest in non-revenue producing space. The under-investment will come back to haunt the organisation with additional capital improvement projects, while non-revenue space such as lobbies is expensive to build and maintain and does not attract more customers than a more modest entrance.
- Finally, enjoy the challenge. While it is easy to be distracted by the negative public attention which can occur, one should keep in mind that this is a tremendously exciting and challenging effort which is available to few healthcare leaders.

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