



# THE BAY DIMENSION

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## Healthcare Facilities

Healthcare facilities have been going through a transition with advances in medical techniques really accelerating starting in the 1980s. Among these changes is the introduction of large diagnostic equipment, requiring specially shielded rooms, and also an increased use of electronic systems for record keeping and communication between different sections of a facility (e.g. the pharmacy may be notified electronically of a prescription when the doctor issues it, so it is waiting for the patient when they go to pick it up). With these technological innovations, coupled with a reduction in the number of hospital beds (resulting

from the move to more outpatient treatment) hospital facilities are becoming as much a hi-tech center as a place for people.

On the other hand, with hospital groups competing with each other to attract customers, their facilities are now being planned as much, if not more, with the patient in mind than the practitioner, trying to provide a more homey, welcoming and caring atmosphere. For instance, final food preparation is often kept close to where patients are housed, in order to provide more flexibility and a more responsive service for patients/customers. While the final food preparation may be kept local, the initial preparation, as with other services, such as laundry, might be provided elsewhere in-house, or provided on a regional basis, or by a commercial contractor.

As mentioned above, there has been a move to more outpatient treatment, reducing the number of hospital beds, which are now, with some exceptions, almost exclusively acute-care beds. Major operations, which would previously have necessitated a hospital stay during recuperation, have now frequently been replaced by less invasive procedures, thanks to miniaturization of equipment and new techniques. These kinds of developments have led to increased use of outpatient facilities, which often include surgical rooms for such procedures. These outpatient facilities are also often being located out in the community as local clinics, taking the healthcare to the people, rather than the old way of people having to go to the large, more distant hospital. These clinics might also contain fitness facilities because preventive medicine or health promotion is receiving more emphasis, trying to keep the population healthy and reducing the need for treatment facilities.

The development of new medical technologies has meant that hospitals now have to be designed to facilitate the changes that are to come. Ideally, designs should try to

anticipate where changes would occur, but technology breakthroughs seldom follow completely predictable patterns. Consequently, designs need to be responsive to changes as they happen. The use of interstitial space facilitates flexibility, but the cost of providing this space often rules out its incorporation in a design. Healthcare campus layout provides the capability for one area to be redeveloped while the rest of the complex continues as normal. A modular approach in the design helps provide flexibility, for instance using a common room size for offices and examination rooms, etc., allows for easy change of use. However, flexibility has a cost, and a life-cycle cost analysis might prove useful to check the value of providing the capability.

Labor can account for around three-quarters of hospital running costs, so a design that promotes efficiency provides a good return. For instance, units with patient beds are now normally arranged so that the nurse is more central in relation to the patients (not the long, narrow wards of years gone by).

## eMedicine

IT and healthcare are coming together in an effort to stem rising healthcare costs. By introducing electronic patient-record systems, hospital groups aim at improving access for practitioners to patient records, increasing the number of patients that physicians can treat, speeding and improving the processing of billing, scheduling and prescription handling, and minimizing the chances of errors made in treatments.

CIO Insight magazine for Fall 2005 had an article about the introduction of HealthConnect in the Kaiser Permanente hospital chain. This \$3.2 billion project involves putting all patient records on a centralized computer system, with practitioners directly entering information about patient visits at the time of the visit (eCharting) and being able to call up past information about the patient as needed. For some of these healthcare workers it looked like a daunting system, but the use of templates makes inputs fast and also provides a check list, and consequently the learning curve hasn't been as steep as many feared. Some of the templates that the practitioners use for charting are ready made, but practitioners can also prepare their own and

share them with others. The system also involves secure messaging, so that patients can consult with their doctor via email. There are also plans to give patients direct access to at least some of their records via a secure Internet interface. It is expected that the use of the HealthConnect system will reduce Kaiser's operating costs by around 10% and reduce medical-records supplies by at least 50%. By speeding up the processing and allowing doctors to see more patients each day, the system is anticipated to increase the hospital group's income by around 15%.



An article in the June 13, 2005, edition of ComputerWorld points out that not all attempts at providing an electronic centralized medical records system has been successful, quoting the dropping of the electronic medical records system at the Cedar-Sinai Medical Center, Los Angeles, after only three months, because the healthcare workers there refused to use it. Actually, Kaiser's HealthConnect was that group's second attempt at a medical records system, after the first attempt failed for a number of reasons. The people that get drawn to a career in healthcare are not necessarily going to be the kind of people to jump at the opportunity to get involved in a computer system. But, as the ComputerWorld article points out, one hospital's traditional system for ordering and filling prescriptions covered 148 distinct steps involving different people and departments, so streamlining that system and ensuring that information gets transmitted efficiently and accurately had to lead to cost savings.

The infrastructure for these electronic records systems obviously adds to the initial cost of hospital facilities. Ten years ago the IT infrastructure for a new hospital might have been expected to be around 2% of the construction costs, but currently it can be around 5% to 10% or more.

## SB 1953-Painful Medicine

Senate Bill 1953 was enacted in 1994 with the goal of ensuring that hospitals remained standing and operational after a major earthquake.

Two of its four major deadlines have already passed. January 1, 2001 was the deadline for the evaluation and ranking of structures, and January 1, 2002 was the date for ensuring that mechanical and electrical systems had adequate bracing to support them during an earthquake.

The two main dates are still in the future, but approaching fast:

- January 1, 2008 is when applicable buildings should not pose a risk of collapse in a major seismic event (although it is possible for an extension to be granted to January 1, 2013, and efforts are being made to legislate a further 7 year extension).
- January 1, 2030 is when applicable buildings are to be in substantial compliance with the Hospitals Facilities Seismic Safety Act.

These conditions apply to acute care hospital structures, and a compliance plan for these buildings was to be prepared and submitted by January 1, 2001, indicating the facility's intent to do any of the following:

- Building retrofit for compliance with these regulations for continued acute care operation beyond 2030;
- Partial retrofit for initial compliance, with closure or replacement expected by 2002, 2008 or 2030;
- Removal from acute care service with conversion to non-acute care health facility use; or
- No action, building to be closed, demolished, or replaced.

This dose of medicine has had some unexpected side effects, though. The year SB 1956 was passed was also the year of the Northridge earthquake, and lessons from that, and subsequent earthquakes, have taught engineers a lot more about how structures are affected by seismic events, and has increased the cost of these upgrades. Meanwhile, it has been estimated that about 36% of California's acute-care hospitals have negative operating margins. Add to that the fact that OSHPOD (Office of Statewide Health Planning and Development), the office that oversees these upgrades, has been suffering from California's budget deficits, resulting in vacant positions not being filled, and has precipitated delays in project approvals. So hospitals are being squeezed on the budget and the schedule, which is critical when the next major deadline is less than two years away, and a hospital construction project can take three to five years to get going.

There are a number of factors that affect the seismic upgrade cost of any building, and some of these factors are particularly applicable to acute care facilities. For instance, the cost of rehabilitating a building that is required to be immediately occupiable after an earthquake (as SB 1953 requires) can be double the cost of rehabilitating a similar building that was only required to protect the lives of occupants during an earthquake. Also, as with any renovation work, whether the building is vacant, partly occupied or fully occupied will have considerable



cost impact, and there is normally not the opportunity to completely vacate an acute care facility during upgrade work, because alternative space is seldom available.

## Hospital Costs

Recently hospital construction costs have been increasing dramatically. It has been estimated that bid prices for hospital projects have increased by about 66% in the past two years, over twice as much as general construction projects (which have themselves been increasing far faster than in previous years). What are the driving forces behind these increases?

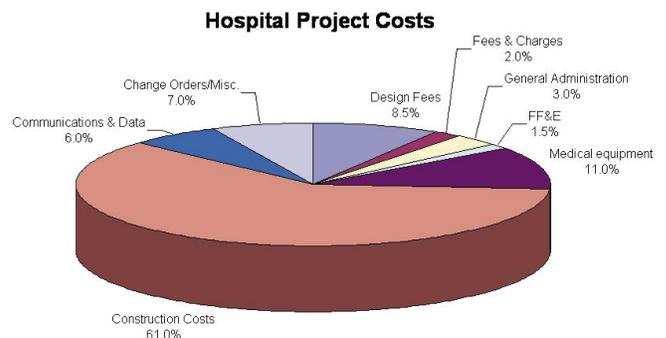
***“Hospital work has its own independent driving force (SB 1953) that is going to keep this market busy even if and when the general construction market falters.”***

- It has frequently been observed that the fewer the number of bidders, the higher the bids will be, and studies have substantiated that observation. It is not the number of bidders that is directly driving up the costs, but the number of bidders and the high bids are both indicative of the fact that the contractors that do this kind of work are already busy. The buildup of work required for SB 1953 has the contractors that can handle acute-care hospital projects with full schedules already, and consequently slow to bid for additional work. Studies show that, on average, under normal market conditions, bids can be expected to be up to about 15% higher than normal when only two bids are received.
- The Bay Area is not alone in experiencing a shortage of skilled workmen, and consequently there is not the migration of workers that is usual in the construction industry. Contractors therefore have to pay more to attract quality workers, and it is high quality workers that are demanded for hospital projects, and the cost

naturally gets passed on. For general construction work it has been shown that when contractors' workbooks are full, bids can be up to around 30% above the "norm", and while some of that may reflect additional profit, some of it is simply the additional cost of doing business in this kind of market.

- With enough work already at hand, contractors can be choosy about which projects they bid for. Straightforward work, such as new general construction will generate more competition, while less attractive work, such as renovation work carried out in an occupied building, will mean that contractors will either not bid it at all, or will do so at a price that they are sure will cover all risks. Much of the SB 1953 work falls into this latter category, but even the overhead associated with OSHPOD supervision makes new hospital work less attractive than many other similar sized projects.

The construction market generally is very busy at present, but it is notoriously cyclical, so we can be sure that a downturn is somewhere up ahead, although it is hard to say when that might be. But the hospital work has its own independent driving force (SB 1953) that is going to keep this market busy even if and when the general construction market falters. Right now though, hospital work is laboring under its own forces and the general construction market conditions, and hospital bid prices are naturally reflecting the combined pressure.



The pie chart above shows the approximate proportions of the Hard Costs (the construction contract price) and Soft Costs (design fees, supervision costs, fees and charges, and other project costs). The actual percentages will of course vary project to project, but the chart above is given as a guide.