

Strategic Facility Planning

Thomas O. McCune, AIA

Strategic facility planning is the process of translating an organization's strategic business plans into medium- or long-range facility plans and alternatives. Traditional architectural space planning skills play a role but must be supplemented by skills in forecasting, financial analysis, scheduling, real estate transactions, hedging, and site selection.

Architectural design was traditionally approached as a process of arranging physical form to fulfill one or more functions. Later, architectural programming emerged as a formal process for analyzing owner needs, concepts, and goals and merging them with known facts and constraints to form a rational basis for a design. Architects even provided cost estimating services as part of their basic expertise. Aspects of these traditional processes, such as determining the size of a building, its probable cost, and the proximity of various related functions, play a role in strategic planning. However, the process of converting strategic business plans into facility plans involves much more.

A strategic facility plan answers the following questions about a corporation's real estate portfolio for the foreseeable future:

- How much space will the corporation need? (quantity)
- What kinds of space will the corporation need? (type)
- During what time period will the corporation need it? (timing)
- How will the corporation procure it? (portfolio mix and duration—buy, build, or lease)
- What will it cost? (budget)
- What will be the “big-picture” sequence of moving into it? (migration)
- Where does the space need to be located? (location)
- Which groups need to be located near each others? (affinity and allocation)
- How will the corporation deal with unplanned changes in demand for space? (hedging and exit strategy)

It may also deal with some or all of the following issues:

- What mechanisms will the corporation employ to let users see the actual costs of their occupancy, forecast their future needs accurately, honor their promises concerning occupancy, and use space efficiently? (internal business model, including items such as internal leases and transfer charges)
- How will the facilities contribute to the core business of the corporation through their effect on marketing, employee recruiting, and employee retention? (corporate identity, location, and amenities)
- Can the corporation reduce total real estate costs per person? (density, design standards, and alternative officing)
- Can the corporation affect employee productivity and rate of production throughput by the design of the facilities? (effectiveness and productivity)

TOM McCUNE is CEO and senior consultant with AE Pragmatics, Inc., a multidisciplinary consulting and outsourcing firm serving Silicon Valley technology companies. McCune serves as the chair of the AIA Corporate Architects PIA Steering Committee.

Summary

STRATEGIC FACILITY PLANNING SERVICES

Why a Client May Need These Services

- ▶ To maximize facility contributions to business objectives
- ▶ To forecast future space needs (type, quantity, location)
- ▶ To ensure adequate lead time for project delivery
- ▶ To provide a basis for annual capital and operating budgets
- ▶ To obtain buy-in from top management
- ▶ To identify possible responses to unexpected changes in space needs

Knowledge and Skills Required

- ▶ Knowledge of architectural programming and space planning
- ▶ Ability to analyze strategic business plans
- ▶ Skill in financial analysis, forecasting, and budgeting
- ▶ Understanding of sequential scheduling
- ▶ Familiarity with permitting and other legal issues
- ▶ Understanding of site analysis, selection, and planning issues
- ▶ Familiarity with real estate transactions and hedges

Representative Process Tasks

- ▶ Analyze business plans
- ▶ Research industry competitors to develop trends and benchmarks
- ▶ Research or prepare staffing and production plans
- ▶ Develop alternative scenarios for the demand for space
- ▶ Develop options for supplying needed space
- ▶ Choose an option and create a plan to implement it

▶ **“Strategies are intellectually simple; their execution is not.”**

Lawrence A. Bossidy, CEO of the heavy industrial firm Allied-Signal, interviewed in Harvard Business Review, March-April 1995

▶ **Large management and accounting firms such as Arthur Andersen, Trammel Crow, and KPMG are dipping into the architectural arena, offering real estate planning and management consulting services to mid- and large-size clients. These services almost always involve building facility considerations and evaluations that architects can perform at a more rigorous and substantive level. How are the Andersens and others achieving these commissions? By “thinking like the client.” Strategic facility management and planning is a service that requires the provider to think like a member of the client’s board of directors and executive staff.**

CLIENT NEEDS

Most corporations do not exist for the primary purpose of building, owning, and operating buildings. Exceptions include organizations such as hotel chains and real estate developers, for whom real estate is a revenue-generating asset. Most corporations use buildings to support the pursuit of their core business.

Corporations develop *strategic business plans* that describe the future the corporation sees for itself. Many strategic planning models have been developed, but some of the most widely accepted are those published by Eliot Porter. Porter’s methods include analyzing a corporation’s strengths, weaknesses, opportunities, and threats relative to four external market factors: competitors, suppliers, customers, and substitute products. Future strategic plans focus on using the corporation’s present resources to fund strategic thrusts into areas of future business opportunity.

Strategic business plans drive *tactical business plans*, which describe sales forecasts, manufacturing plans, staffing levels, geographic location, and budgets. It is these tactical business plans that directly affect facility plans. While it is rare for facility planners to be directly involved in the strategic business planning process, they frequently participate in the tactical side of business planning. Facility planners use tactical business planning information as input to strategic facility plans and provide feedback that contributes to future tactical and strategic business plans.

It is currently fashionable for managers of almost every business function to claim that their particular group is of life-and-death importance to the corporation’s strategic business plans. Facility planning is no exception. However, as a practical matter, major corporations rarely use facilities as their primary strategic basis for acquiring other companies, diversifying into global markets, or developing major new product lines. Instead, the usual role of strategic facility planning is to support these strategic business decisions.

Acquiring real estate and building facilities are long-lead-time processes. In the case of a large new facility, the process traditionally took three to four years or longer from site selection to occupancy. Even with expedited approvals and fast-track construction, the process now commonly takes more than two years. Corporations need to develop strategic facility plans well in advance of actual needs to ensure that the right types and quantities of land, buildings, and services exist in the right places at the right times to house the corporation’s employees and equipment.

If a corporation fails to procure adequate space in the best locations at the right time, this can impair the corporation’s ability to hire the quantity and quality of personnel necessary to develop new products and market existing ones. At the most basic level, it can restrict a corporation’s ability to produce enough product to meet market demand. Over the long term, this can lead to erosion of the corporation’s market share and a decrease in its competitiveness. In the case of a shrinking corporation, the inability to quickly divest non-performing real estate can also decrease the corporation’s competitiveness.

Many corporations have their own employees develop long-range facility plans.

Strategic Facility Planning for the Nonprofit and Government Sectors

Although this topic is focused on planning for corporations, nonprofit and government organizations face many of the same challenges and occasionally contract with architects to provide strategic facility planning services. Many of the basic planning techniques are similar for all organizations,

but the basic business drivers are different. While corporations are profit-driven, the others are expense-driven. Other differences in planning for these organizations are summarized in the matrix shown here.

Comparison of Issues in Facility Planning for Different Organizational Types

PLANNING ISSUES	CORPORATIONS	NONPROFITS	GOVERNMENT
Financial drivers	Revenue, profit	Expenses	Annual budget
Volatility	Potentially high	Moderate or low	Usually low
Exit strategy	Important	Usually unimportant	Usually unimportant
Tax consequences	Very important	Unimportant	Unimportant
Politics	Important	Very important	Extremely important

However, some engage design or consulting firms on either a project basis or an ongoing partnering basis. Architects who develop the necessary processes and hire staff with the right skills are well positioned to serve this client need. Once a firm has begun offering strategic planning services, it can also offer related services such as design standards programs, workplace effectiveness studies, computer-aided drafting (CAD), computer-aided facility management (CAFM), and move coordination.

SKILLS

Many of the traditional architectural programming and design skills apply to strategic facility planning. The most pertinent of these abilities are analyzing client goals and needs, identifying facts and constraints, generating concepts, and developing space plans. Architecture firms that offer strategic facility planning services supplement these traditional architectural skills with skills and training from other fields, including the following:

- Finance: financial analysis, forecasting, benchmarking competing companies, demographics
- Law: permits, entitlements, restrictions
- Industrial engineering: materials handling, plant layout, throughput analysis, capacity planning
- Civil engineering: transportation planning, site analysis, drainage, utilities
- Landscape architecture: site planning, site selection
- Real estate: site selection, costs, demographics
- MEP engineering: utilities, network telecommunications

Forecasting is the process of translating historical correlations, industry trends, economic indicators, and company goals into forward-looking estimates of business drivers and space needs. The simplest form of forecasting is *extrapolation*, which consists of naively extending past trends into the future. In the case of simple trends, *linear regression* can determine the mathematical equation that best fits a line to the existing data points. Extending this linear equation into the future provides an exact mathematical extrapolation of the trend. *Regression analysis* can also fit exponential and higher-order mathematical trends to existing data and extend these trends into the future. Exponential trends are often used to forecast high-growth industries. *Prediction intervals* provide mathematical “probability brackets” around future predictions created by regression analysis. These basic forecasting skills are taught in any good college statistics course, and modern computer spreadsheet programs perform all of the basic operations with ease.

Financial analysis. In complex business situations, simple extrapolation of mathematical trends is usually inadequate for meaningful planning. Analysis of company plans and industry forecasts requires skills in financial analysis. Analysis of competing companies with similar organizational structures and product lines can yield useful ratios and benchmarks to use in forecasting the performance of the company in question.

Space planning. Macro-level space planning skills are the most relevant to strategic planning. These skills include

- Developing gross planning densities based on prototypical facilities or theoretical test fit studies
- Analyzing affinities between user groups and arranging large blocks of space to accommodate these affinities
- Analyzing shell building designs (either existing buildings or proposed designs) for suitability

Site selection. Site selection, a service widely offered by commercial real estate brokers and their consulting subsidiaries, can also be offered by architects. In any case, site selection needs to be built into the strategic facility plan as part of the overall process. Most experienced architects have adequate training and background to assess the physical aspects of a site, at least in the “big picture.” However, selection of a major site also involves

- Economic skills, for analyzing demographic elements such as proximity to the workforce

- Financial skills, for analyzing costs
- Negotiation skills, for negotiating tax incentive packages offered by competing communities
- Political skills, for negotiating with competing sellers and communities for the fewest restrictions and the most services at the least cost
- Engineering skills, to analyze site access, transportation, utilities, and drainage
- Site planning skills, to determine how efficiently any particular site can be used

Scheduling and sequential migration planning. Although taught in only a few architecture schools, this skill is essential to getting user groups into their desired locations at the right time without wasted moves, redundant moves, or excessive swing space. CPM (critical path method) scheduling, a powerful tool used by construction managers, is adaptable to planning a complex sequences of moves.

Budgeting. Some architects are trained in construction cost estimating. Traditionally this was unit-price estimating involving detailed quantity take-offs, material costs, and labor rates. Budgeting for strategic facility plans involves higher-level estimating of a wider range of items. This may involve construction loan financing, raw land costs, A/E fees, FF&E costs, real estate commissions, utility connections, move costs, commissioning, temporary facilities, and network telecommunications in addition to construction costs. The owner's internal project management labor costs may even be included in the total project cost. The strategic facility plan must separate capital investments from operating expenses. For example, many architects do not realize that most owners treat architectural fees as capital investments, since they are essential ingredients of capital construction projects.

Strategic facility planners must first be able gather information about the gross costs of comparable facilities. These costs must be adjusted for location, market conditions, and inflation over time. The planner may establish trends and confidence intervals using linear regression analysis. Planners must be able to spread budgets over several fiscal years using cash-flow forecasting. Finally, planners must be able to analyze the relative advantages of alternative financing methods such as synthetic leasing and nonrecourse financing. Specific techniques for these analyses include net present value, internal rate of return, and equivalent annual cost. Any basic course in finance, such as those taught in most MBA programs, teach these basic skills.

Research in economics. The ability to research companies that compete with your client is necessary to develop or confirm the basic business drivers for a strategic facility plan. (We will call the basic business statistics—such as revenue, head count, and unit sales—“drivers” or “business drivers” for lack of a better term.) In the case of public companies, information about their past revenues, head counts, and even real estate portfolios can be found in their annual reports and related documents such as 10-K reports. This information can be downloaded from the Web site maintained by the Securities and Exchange Commission or, in some cases, from the company's own Web site. Industry analysts are another source of information. This admittedly large category includes journalists, trade association officials, academic experts, government officials, and financial analysts employed by a variety of financial institutions.

You can gather two fundamentally different types of information—historic (actual) data and future forecasts. In rare cases it may even be possible to assess the accuracy of past forecasts by measuring the difference between past forecasts and actual performance.

For purposes of facility planning, historical analysis of competing companies is valuable in establishing trends and correlations between variables. *Elasticity* measures the change in one variable in relation to another variable. For example, if over time a 9 percent change in employee head count correlates to a 10 percent change in revenue, the elasticity of head count to revenue is 0.9 (90 percent).

Written communications. Architects have always been trained to draw. The design studio system has also trained us to speak persuasively about our designs, whether we realize it or not. However, architects typically receive little formal training in technical writing.

Strategic facility plans are written documents accompanied by charts, graphs, and diagrams. The written narrative is the part that describes what the planners are trying to achieve and persuades executive management to provide the resources necessary to carry out the plan. Written communications need not be elaborate, but they do need to be clear, simple, grammatically correct, and convincing.

PROCESS

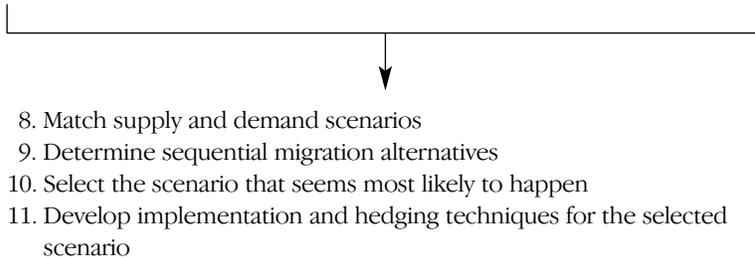
Strategic facility planning frequently consists of two cyclical processes that come together on a regular basis. The demand cycle comprises those forces that drive the demand for space. The supply cycle comprises those forces that affect the supply of space. The two cycles come together annually in small and slow-growth companies but quarterly in large and fast-growth companies. Once the demand and supply cycles have merged, the steps shown below as 8–11 are taken:

DEMAND CYCLE

1. Strategic forecasts of revenue, product mix, geographic markets, mergers and acquisitions
2. Tactical forecasts of head counts, unit sales, R&D projects
3. Geographic location drivers
4. Workplace research, standards
5. Translation into square feet and features
6. Affinity relationships
7. Demand scenarios

SUPPLY CYCLE

1. Portfolio additions and deletions (construction, leases, divestitures, etc.)
2. Occupancy/vacancy inventory
3. Future additions and deletions (forecast)
4. Budgets, financial constraints
5. Compare past forecasts to actual supply and demand
6. Identification of possible new sites
7. Supply scenarios



Demand Cycle

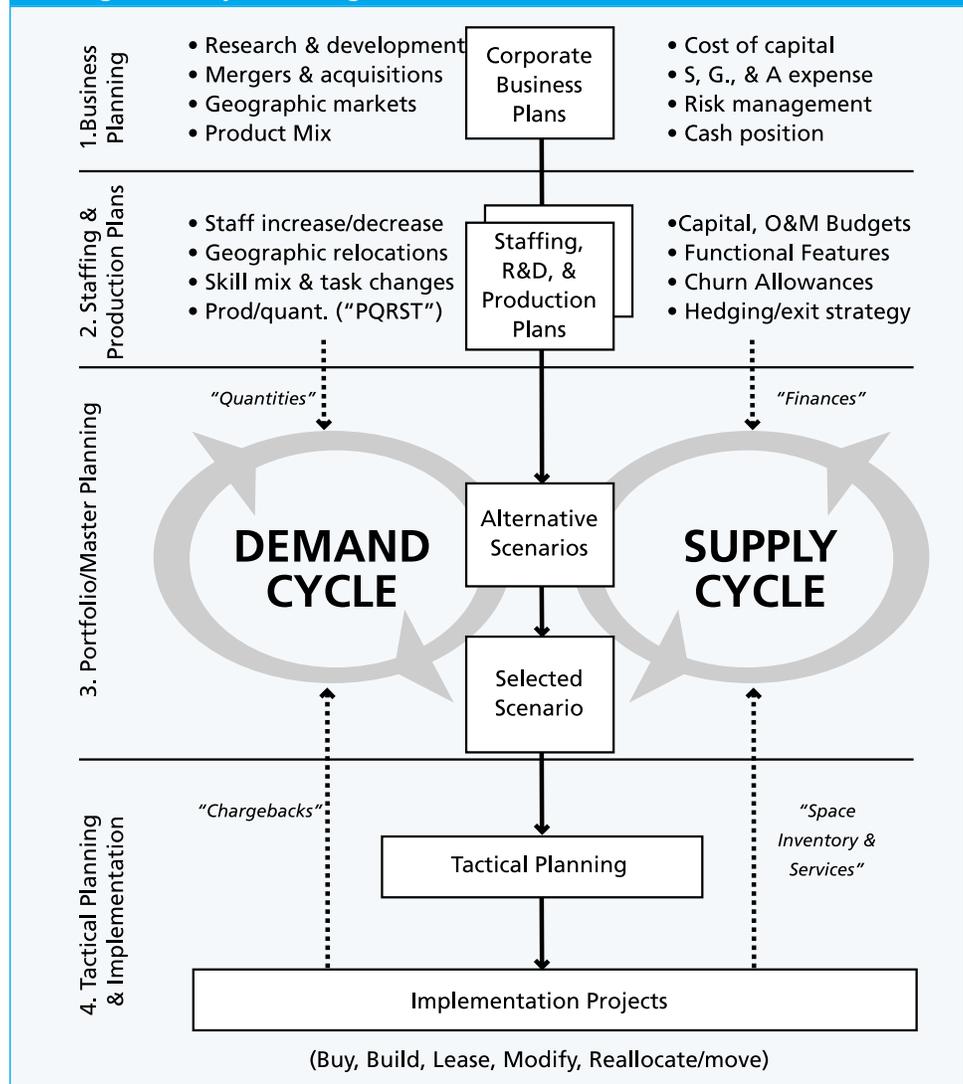
The demand cycle represents the users' view of the portfolio. Forecasts from the strategic and tactical business plans are converted into forecasts of demand for space over time. While there is no perfect way of doing this, benchmarking various measures of elasticity is sometimes the best that can be done. If the elasticity of head count to revenue is high for both the company in question and its competitors, then revenue is a relatively good predictor of head count. (For example, if benchmarking studies show a 0.9 elasticity of head count to revenue, then a 100 percent increase in revenue can be expected to correspond to a 90 percent increase in head count.)

In extreme cases a corporation may lack credible projections of some or all of its basic business drivers. If this is so, the planner may need to develop independent forecasts of the corporation's basic business performance before developing the strategic facility plan. In some situations planners need to be able to go to executive management and say, "If you don't give us anything better to go on, here's what we will plan for."

Geographic location decisions are determined by a variety of factors. Retail and certain types of industrial businesses may be driven by proximity to customers. Bulk commodity businesses may be driven by proximity to suppliers or raw materials. High-tech businesses may want to locate near population centers with highly educated workers. Low-tech but labor-intensive businesses may want to locate facilities near population centers with inexpensive labor. The task of the planner is to determine which factors are most important to the corporation in question and to identify communities that best match those factors.

One of the most visible aspects of demand-side planning is the translation of all of the foregoing factors into square footage and required features. Head count is a reasonably good predictor of office space, although the recent trend seems to be toward greater density. Benchmarking similar office facilities can yield gross planning densities per seat, but don't forget two items: churn seats and workers without assigned seats. At any given time, roughly 10 percent of seats need to be empty "churn" seats. However, workers without assigned

Strategic Facility Planning Process



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seats can account for ratios of more than one worker per seat. Both factors need to be accommodated in planning density. Workplace research can lead to office planning standards that offer greater densities due to more compact designs and more unassigned seating.

In the case of manufacturing space, units of annual throughput may be the best high-level predictor of space required. For example, an engineering analysis may suggest that 110 square feet of manufacturing space will be needed per unit produced. When a detailed manufacturing and materials-handling analysis is not available, or when the manufacturing process has not yet been developed, benchmarking similar facilities for square feet per unit can be helpful.

The culmination of the demand cycle is one or more demand scenarios, which describe the future state of the portfolio as viewed by the demand side of the equation (i.e., the users).

The following items outline key information that is needed during the demand cycle, giving suggestions for where to find the information.

Corporate strategic business plans for revenue, geographic locations, and markets. Possible sources for this information include corporate planning or finance staff members or the CEO. Ideally, you would also like information on proposed mergers, acquisitions, and divestitures; however, it is extremely unlikely the CEO will release this information to you.

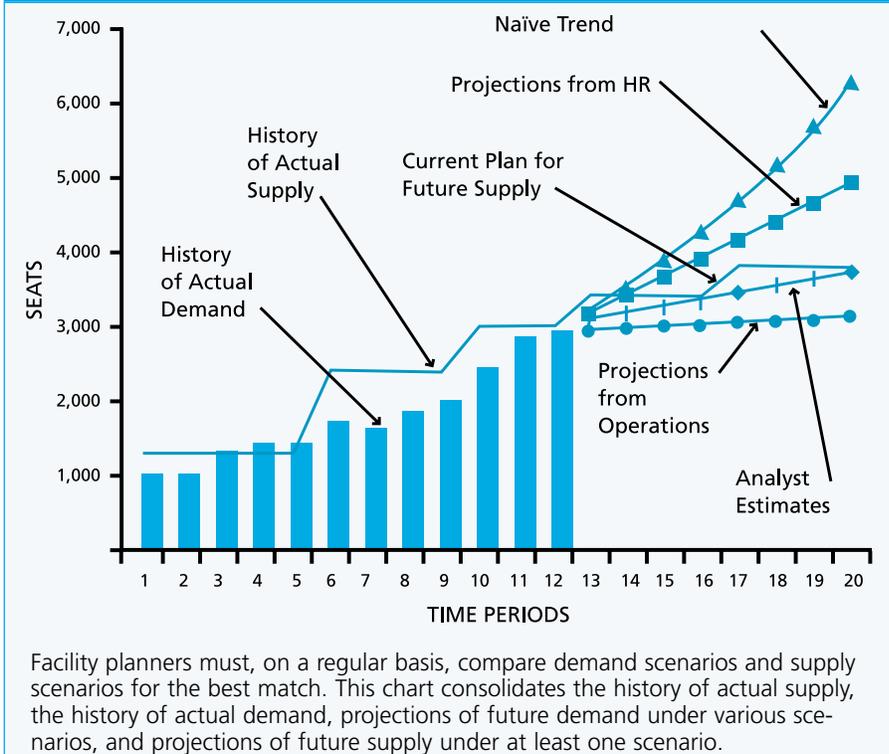
Head count forecasts by division and worker type. Possible sources for this are the human resources department, the finance department, or the operating units. However, different sources tend to make different forecasts, and it is

unlikely that any of them will credibly predict three years out, which is the minimum time frame necessary for strategic facility planning. *Units of sales and production by product type.* Possible sources for this would be marketing or manufacturing divisions. While one of the best predictors of office space requirements is head count, one of the best predictors of manufacturing space is units of throughput.

Affinity relationships between major user groups. Possible sources for this material are line managers of the groups. Alternative officing strategies. These strategies are generally proposed by the real estate, human resources, or operating groups. They can improve the traditional ratio of “one person, one office” used in most traditional planning.

Forecasts of industry growth, unit sales, and trends. Possible sources are industry analysts, trade groups, and government agencies.

Matching Supply and Demand Scenarios



Facility planners must, on a regular basis, compare demand scenarios and supply scenarios for the best match. This chart consolidates the history of actual supply, the history of actual demand, projections of future demand under various scenarios, and projections of future supply under at least one scenario.

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Supply Cycle

While the demand cycle effectively represents the user’s view of the portfolio, the supply cycle represents the landlord’s view.

The first step in the supply cycle is to document changes in the portfolio during the reporting period. New properties that have entered the portfolio increase the supply of available space, while divestitures decrease the supply. Planners inventory the space to determine how much is actually occupied. (For example, there may have been no additions or divestitures, but a detailed inventory could reveal that 35 percent of the seats are unoccupied.) When future planned additions and divestitures to the portfolio are noted, the description of the space available over time becomes complete.

Budgets as financial constraints are largely a function of the supply side of the equation, since it is the landlord part of most corporate real estate organizations that provides the resources to build or otherwise acquire property.

Finally, while the users on the demand side of the equation state their requirements for space, it is frequently the landlord function on the supply side that actually locates and procures new property. Steps that are part of the site selection process include the following:

- Determine allowable site density based on governing regulations and good practice.
- Assess proximity to workforce population centers (demographics).
- Analyze proximity to transportation, utilities, and other infrastructure.
- Evaluate physical aspects of alternative sites, including topography, geology, and geometry.
- Understand financial attributes of various sites, including initial cost, tax incentives, and resale value.
- Assess the liabilities of various sites, including environmental problems, undesirable neighboring properties, covenants, easements, deed restrictions, archaeo-

- logical impediments, and other entitlement restrictions.
- Confirm adequate on-site circulation and parking.
- Determine if there are similar businesses already in the area.

When the aforementioned information has been assembled, describing the future of the portfolio from the point of view of the supply side of the equation, the supply scenario is complete and it is time to begin melding the demand and supply scenarios into a single, selected portfolio scenario.

The following items suggest key information that is needed during the supply cycle and gives ideas about where to find that information.

Occupancy of existing buildings. Possible sources are human resources reports, previous move packages, network addresses, physical inventory of existing buildings by the planning staff, or a CAFM system if it has been maintained accurately.

Real estate market conditions. This includes vacancy rates, lease rates, available square footage, and building sizes in the vicinity.

Alternative officing strategies proposed by the real estate group, human resources department, or operating groups. These strategies can improve the traditional ratio of “one person, one office” used in most traditional planning.

Selected Scenario

We now have one or more demand scenarios and one or more supply scenarios. The challenge is to select which supply scenario to implement. Selection strategies include these:

- *The stop-loss strategy.* This minimizes the downside risk of loss but may also limit the upside potential for gain. An example might include leasing space in small chunks with short-term leases so that space could be divested quickly if demand declines. Unfortunately, this would be an expensive strategy if the company grows and requires much additional space.
- *The swing-for-the-fences strategy.* This maximizes upside gain but does little to minimize downside risk. An example would be building a lot of space well ahead of the time when it might be needed, in the expectation of rapid growth. This would work well if the growth occurred as planned but would be very expensive if it did not.
- *The probabilistic strategy.* This attempts to assess the probability of occurrence of various future demand scenarios and to select the supply scenario that works best with the scenario most likely to occur.
- *The goodness-of-fit strategy.* This attempts to select the supply scenario that works acceptably with the widest range of future demand scenarios. The scenario that is finally chosen may not work perfectly with any demand scenario but rather works adequately with many.

Regardless of the technique used, the selected scenario must accommodate common problems and issues. These include lack of credible business plans and forecasts, the ups and downs of the business cycle, and hedging against failure.

Lack of reliable business plans and forecasts on which to base strategic facility plans. Strategic facility planners need to interact at the highest levels of the corporation to ensure they have access to current strategic and tactical planning information. Such interaction creates an opportunity to enhance the visibility and value of the facility planning function.

The need to accommodate the cyclical nature of business in the long term. The long-term lesson of business is that sooner or later all companies experience a downturn. No trend continues forever.

The risk that big bets on unproven products will fail. In industries with very rapid product cycles, corporations must always be developing new generations of prod-

Strategic Facility Planning Terms

Affinity: Any form of working relationship that creates a need for physical proximity between two or more groups of workers.

Alternative officing: Any form of telecommuting, hoteling, unassigned seating, or other strategy that moves away from the traditional arrangement of "one person, one office."

Duration: The weighted average length of leases remaining in a portfolio.

Hedge: Any strategy intended to reduce future adverse consequences associated with a course of action or to provide additional future alternative courses of action.

Migration: A sequential process of several moves intended to move multiple user groups from their current locations to a desired future set of locations and proximities.

Shareholder primacy doctrine: The name for the legal principle that states that a corporation's primary duty is to maximize shareholder value and wealth.

Supply-constrained: Unable to supply the volume of product demanded by customers.

Synthetic lease: A special type of lease with option to buy that is treated as an operating lease for tax purposes instead of as a capital lease.

Throughput: The number of units that can be produced by a manufacturing plant during a given unit of time (40 automobiles per hour, for example).

Transfer charges: Any financial charges within a corporation from one internal group to another.

Variable labor: Temps or workers paid for piecework.

Workplace effectiveness: Any study of workplace productivity, employee satisfaction or retention, or any other factor that ultimately justifies improving or modifying the workplace to meet the business needs of a corporation.

uct. In some cases they need to think several product cycles ahead of the current market. It is frequently better to bet on success than to promote failure by failing to have adequate facilities to support the core business.

“Strategic Facility Planning” was originally published in *The Architect’s Handbook of Professional Practice*, 13th edition, ©2000 by the American Institute of Architects, published by John Wiley & Sons, Inc.

The AIA provides a contract document designed especially for alternative architectural services.

B102–2007, Standard Form of Agreement Between Owner and Architect without a Predefined Scope of Architect’s Services.

AIA Document B102–2007 is a standard form of agreement between owner and architect that contains terms and conditions and compensation details. B102–2007 does not include a scope of architect’s services, which must be inserted in Article 1 or attached as an exhibit. Special terms and conditions that modify the agreement may be included in Article 8.

The separation of the scope of services from the owner/architect agreement allows users the freedom to append alternative scopes of services.

AIA Document B102–2007 replaces and serves the same purpose as AIA Document B141–1997 Part 1.

For more information about AIA Contract Documents, visit www.aia.org/contractdocs/about

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