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San Diego's Capital Planning Process

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As part of its capital planning process, the San Diego Unified School District (California, United States) has developed a systematic analysis of functional quality at each of its school sites. Functional quality is a critical criterion in educational facility planning and a necessary complement to building condition assessment.

INTRODUCTION

Capital planning for schools should include both qualitative and quantitative dimensions. And while building condition remains an important and necessary factor in short- and long-range facility planning, by itself it is not sufficient to reveal the full range of building performance issues or to guide decision making and strategies for prudent capital investments.

Functionality – sometimes referred to as "serviceability" or "fitness of purpose" – has to do with how school buildings and sites support users' activities. Its reference points are the owner's operating requirements that represent the purposes and objectives for which the facility was originally designed and built, plus the many new functional requirements that have inevitably arisen over time (driven by such factors as enrolment growth or decline, grade reconfiguration, trends in curriculum, technology or educational philosophy, and community uses). In terms of functionality, a school can have positive attributes – it can be safe and secure, healthy and comfortable, cost-effective and environmentally sustainable, even uplifting and inspirational – or negative ones – it can be overcrowded or underutilised, dilapidated or obsolete, inefficient and expensive, or even dangerous.

Normal Heights Elementary School in San Diego, California, designed by Zagrodnik Thomas Architects

Photographer: Pablo Mason

Normal Heights Elementary School

Photographer: Pablo Mason

There is a welcome and growing body of literature on links between the functional quality of educational buildings and the academic performance of the students who occupy them.[1] This research is also consistent with new attention to the environmental aspects of schools, which are significant in terms of embodied pedagogy, the health and comfort of educators and learners, and, indeed, the long-term prospects for life on the planet.

The design specification document used by individual school districts usually serves to measure the functionality of existing schools. Functional metrics typically consist of detailed descriptions of aspects such as: site size and recreational space areas; parking requirements; room dimensions and configurations; type, quantity and quality of fixtures and fittings; heating; ventilation; cooling; lighting and auditory standards; office space and storage requirements.

THREE MEASURES OF PERFORMANCE

By identifying and quantifying the discrepancies between **design standards and the status of an existing facility**, a preliminary measure of performance can be developed for key building elements. Examples include the number of parking spaces, the area of play spaces, the size of rooms, the number of offices, the number of sinks and fume hoods in science labs, and the quantity of storage.

A deeper analysis is needed to measure performance in terms of the **condition of the structure and mechanical systems**. This information can be collected systematically and comprehensively during building audits by *knowledgeable* observation as well as through dialogue with building users. Structured interviews and *ad hoc* conversations with educators, administrators, and support and operations staff are an essential part of the process.

1. See, for example: S. Higgins *et al.* (2005), *The Impact of School Environments: A Literature Review Produced for the Design Council*, The Centre for Learning and Teaching, School of Education, Communication and Language Science, University of Newcastle, Newcastle, United Kingdom; Victorian Institute of Teaching (2007), "The Effect of the Physical Learning Environment on Teaching and Learning", Victorian Institute of Teaching, Melbourne, Australia; National Clearinghouse for Educational Facilities (NCEF) (2008), "Resource List: Impact of School Facilities on Learning", *www.edfacilities.org/rl/impact_learning.cfm*, accessed 5 December 2008; M. Schneider (2002), *Do School Facilities Affect Academic Outcomes?*, NCEF, November; M. Schneider (2002), "Public School Facilities and Teaching: Washington, DC and Chicago", State University of New York at Stony Brook, Stony Brook, New York.

The findings from this phase of the audit could reveal problems such as:

- pre-school or kindergarten classrooms not located to ensure safe drop-off and pick-up;
- adequately sized but poorly configured classrooms;
- counselling areas without adequate privacy;
- adequate number but inconveniently located staff washrooms;
- obsolete special purpose classrooms (*e.g.* foods, woodworking) functioning as general education classrooms;
- accessible washrooms not located near special education classrooms;
- kindergarten classrooms without cooking facilities or age-appropriate washrooms;
- new but poor quality lab fixtures susceptible to student vandalism.

A separate and critical category of functional performance issues identify **conditions that actively impede teaching, learning and working** in school buildings. These include health and safety hazards, significant classroom overcrowding, excessive external or internal noise, extremes of temperature or humidity, odours, or inadequate lighting or glare.

The information collected from building audits can be displayed in various groupings. An overall building evaluation based upon its status relative to design specifications, the condition of the structure and mechanical systems, and its impediments to productivity will permit comparisons and rankings across the portfolio. And only with a clear sense of the functional requirements of occupants, and how each building does or does not support those requirements, can the facility planner confidently assemble effective short- and long-range capital plans.

THE SAN DIEGO UNIFIED SCHOOL DISTRICT CAPITAL PLANNING PROCESS

From 2002 through 2007, a methodological approach that embodies the philosophy of "systems thinking" was part of the capital planning process for the San Diego Unified School District (SDUSD). This is the second largest urban school district in California, and the eighth largest in the United States.

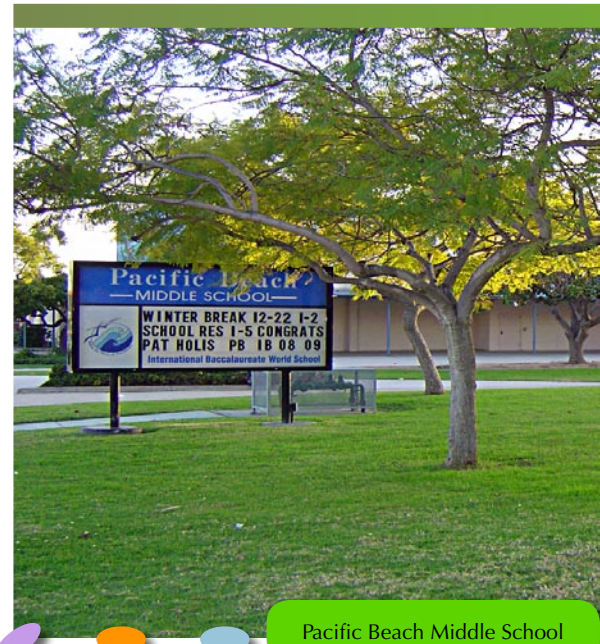
Number of educational facilities in the San Diego Unified School District

Elementary schools: 118
Middle schools: 24
High schools: 29
Charter schools: 35
Atypical or alternative schools: 15

Total: 221

Simply put, systems thinking is an approach to problem solving which recognises that the only way to fully comprehend why a problem occurs and persists is to understand the part in relation to the whole.[2]

2. Systems thinking has been compellingly elaborated by, among many other writers, Peter Checkland in *Learning for Action: A Short Definitive Account of Soft Systems Methodology…* and Peter Senge in *The Fifth Discipline: The Art and Practice of the Learning Organization.*



Pacific Beach Middle School

At the outset, **basic site and building data** were collected for every educational facility in the district, and **interviews** were conducted with middle school and high school principals, the heads of special education departments, and high school athletic directors. The basic building data were compared to SDUSD or California Department of Education specifications and standards. The data quantified the existing conditions in the following categories:

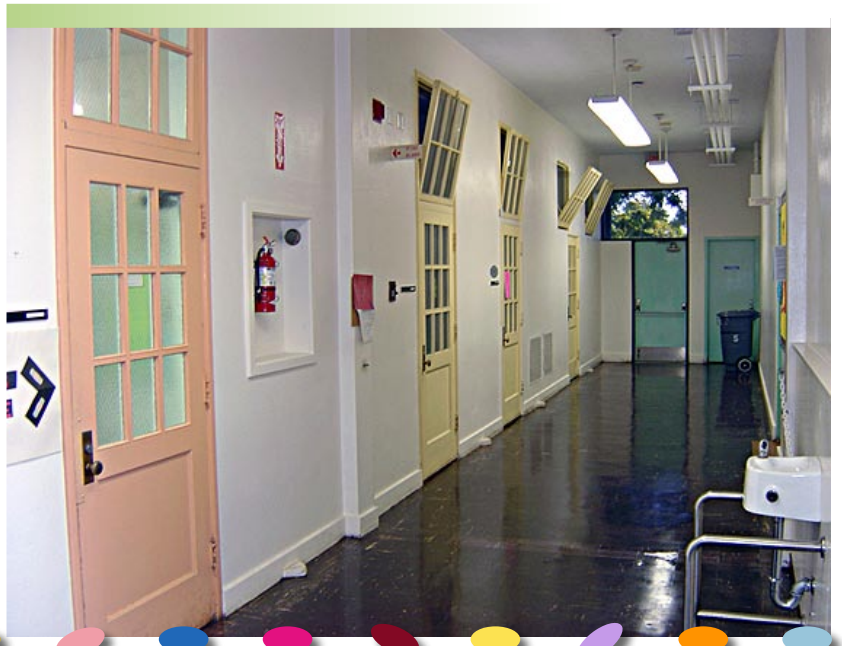
- spatial dimensions of useable acreage, paved play space and field areas;
- number of parking spaces (including handicapped);
- number of regular education classrooms smaller than the district specification of 89 m^2.

Also tabulated was the total number of portable buildings on-site, of portable buildings over 40 years of age, and of obsolete classrooms at each site.

This initial district-wide collection of building data was followed by a more intensive investigation of a subset of schools, supplementing spatial and age data already compiled. For this phase, a representative sample of three elementary schools, two middle schools and two high schools was selected, each school typical of an era of construction. One of the high schools had also been subdivided into four autonomous "learning communities" within the original building, a recent trend in school districts across the United States.

The audits involved **visits** to the majority of rooms in each building, where measurements and photos were taken, observations recorded, and occupants asked about pluses and minuses in the space. The summarised findings from this phase were subsequently organised and displayed in spreadsheets alongside specifications for each element, with special emphasis on the following:

- undersized classrooms (including all special-purpose spaces in middle and high schools, such as music, art, drama and trades);
- total number of science labs in middle and high schools (formula driven by student population);



Pacific Beach Middle School

- configuration and adequacy of facilities and equipment in all special-purpose spaces at middle and high schools;
- adequacy of special education spaces in all schools;
- total number and adequacy of pre-school facilities at elementary schools;
- number and adequacy of support spaces in all schools.[3]

The audit teams elicited **comments** from occupants covering topics that included: appropriate or inappropriate configurations of dedicated rooms; quality of fixtures and fittings; student classroom loading and crowding; the adequacy and utility of storage; indoor air quality; noise; and other conditions that either impede or enhance teaching and learning. These dialogues tended to reveal broader themes of staff and student morale, staff turnover rates, satisfaction with maintenance and operations, or confidence in the administrative and educational leadership.

The quantified deficiencies were then converted to percentages of the total spaces in the school, to rank facilities in terms of their overall functional scores. With this **ranking**, in conjunction with building condition evaluation and projections of future demand, capital planning options and strategies were developed.

These extensive investigations formed a clear, detailed snapshot of each site allowing meaningful **comparisons** between sites. The key issues at each site were synthesised on a single page, enabling the capital planning team and design consultants to focus quickly on areas of significant deficiency and impediments to the school mission. Options to mitigate deficiencies were explored in round-table discussions, and order-of-magnitude costs were estimated.

3. The burgeoning number of instructional support, therapeutic and paraprofessional staff in U.S. schools has forced attention on their needs for space for such functions as clinical services, programme administration, second language instruction, adult literacy, counselling, testing, physical therapy, and numerous types of individual and small-group instruction.

CONCLUSIONS FROM THE SDUSD CAPITAL PLANNING PROCESS

What lessons we can learn from this example of a functionally-based capital planning process? In the first place, facility master planning must recognise that a school is a complex and dynamic system, and that static, overly simplistic planning methodologies will inevitably fail to take account of important realities. Secondly, a planning process that is based – as I believe it must be – on understanding the multiple dimensions of a school at a particular moment in its life cycle will accurately capture the state of the campus both functionally as well as physically. In addition to providing a facility condition index, such a process raises necessary questions about the functional effectiveness of the site in terms of sustainability, health and safety, support for teaching and learning, and accommodation of community uses, to name only a few.

The advantage of the approach modeled in San Diego is that it seeks to develop and apply quantifiable metrics and standards for the more qualitative aspects of functional performance. And once quantified, these various factors can be weighted and ranked – an equally important ingredient in any meaningful capital planning process. For example, remediation of imminent hazards, repairs to prevent extensive building damage, or compliance with standards of health, safety and accessibility are obviously high priority items demanding immediate capital investment. Second only to these priorities are functional deficiencies that undermine the primary mission of teaching and learning.

In order to effectively advance a functionally-based approach to capital planning of educational facilities, additional pilot projects are required, along the lines of the San Diego process described above. Beyond that, new forms and processes must be developed to standardise the methodology and to train planners and other officials in its use and application. The system needs to be tested in the widest possible range of environments and circumstances, and modified iteratively on the basis of these experiences.

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