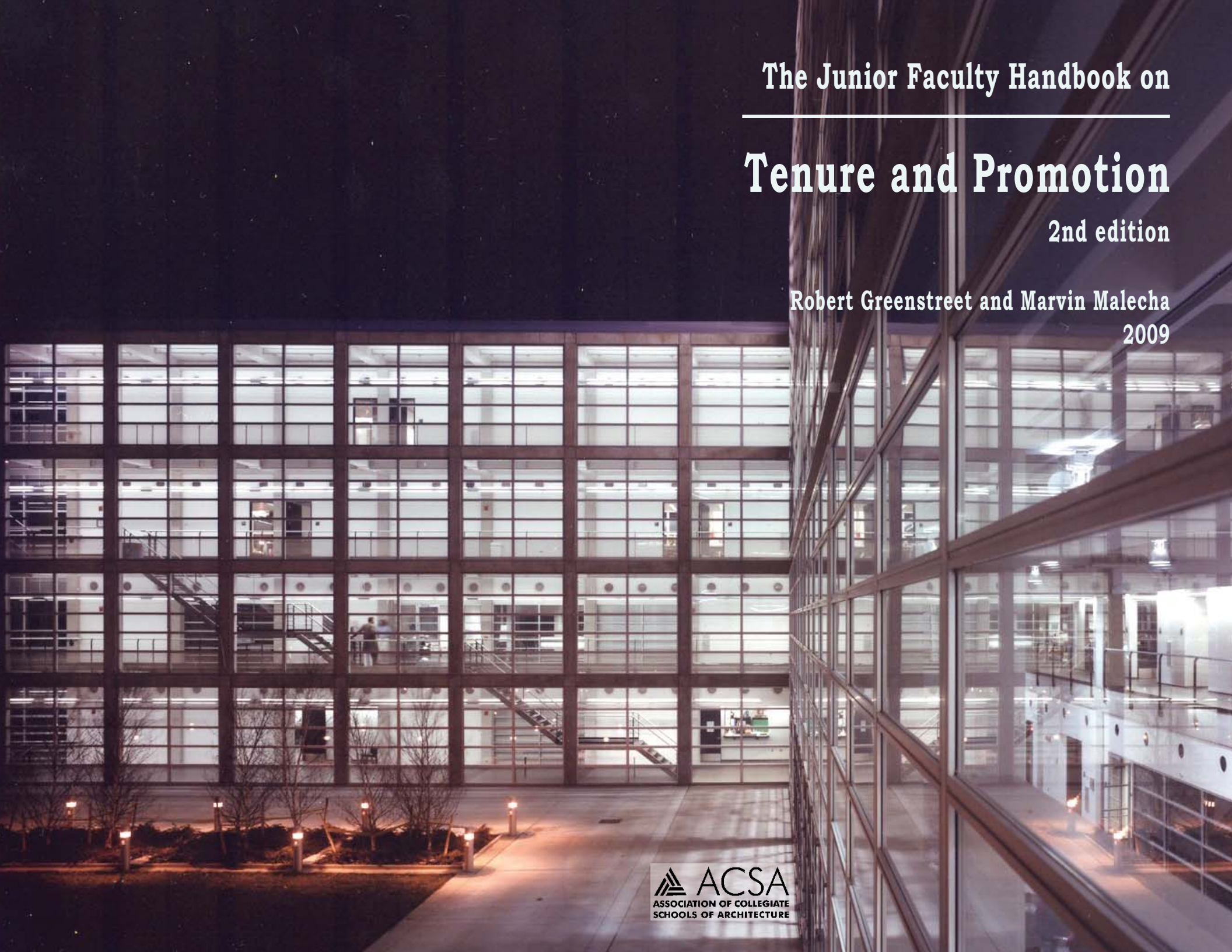

The Junior Faculty Handbook on

Tenure and Promotion

2nd edition

Robert Greenstreet and Marvin Malecha

2009

ACSA
ASSOCIATION OF COLLEGIATE SCHOOLS OF ARCHITECTURE

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"Celebrating 40 Years of Relevance"

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PROLOGUE

During the 1990-91 Academic Year, Marvin Malecha served as President of the Association of Collegiate Schools of Architecture, while Bob Greenstreet was elected Secretary of the Board of Directors, becoming President in 1995. As part of his platform in the election, Greenstreet introduced the concept of the Junior Faculty Initiative, an attempt to institutionalize a program of guidance and opportunity directed towards faculty working their way towards tenure and seeking to excel in teaching, research and service. With support from Malecha and the Board of Directors, the Initiative resulted in the New Faculty Teaching Award and the Junior Faculty workshops, which have been offered from time to time for the last few years at the Annual Meeting. Malecha and Greenstreet have also offered a similar workshop at the Association of Collegiate Schools of Planning conference, and decided to develop the contents of the workshops and other material they had collected through associated activities (mentoring programs, ACSA New Administrators' Workshop, etc.) in a handbook for general distribution to ACSA members. The *Handbook* was first published in 1995 and was revised and published as a second edition in 2009.

It should be stressed that the contents of this handbook solely represent the authors' viewpoints and opinions. There are over one hundred and thirty architectural programs in the United States scattered between private and public institutions. Some are joined with other disciplines, some are administered through faculty governance and some are governed by state legislation. While the concept of tenure and advancement is similar in most of the the schools, procedures, responsibilities and requirements are likely to vary. Similarly, styles of leadership are dependent upon personality, which may also affect the tenure process in individual programs. While much of the material contained in this handbook is sufficiently general to provide guidance through the tenure process, the reader is strongly advised to consult with senior colleagues and administrators to confirm that his or her approach to the procedural and substantive aspects of their tenure process are appropriate.

AUTHORS' STATEMENT

We have written this handbook based upon a shared belief that the tenure process should be a productive period of opportunity for individuals to excel in their professional pursuits of teaching, research and service. We reject the concept of tenure as a process of academic "hazing," whereby new faculty are either overextended as front-line teachers or left to sink or swim without direction by their senior colleagues. Instead, we believe that new faculty are an investment in the future of each program and, like any investment, should be nurtured and maintained. To do otherwise is a waste of precious resources.

This should not be interpreted as a call for lower standards. On the contrary, excellence needs to be strived for at all costs to ensure the highest possible levels of academic performance in our schools, and if individuals are incapable of making the grade, they should not be retained and promoted. However, in some instances, failure to clear the tenure hurdle is due to factors not necessarily associated with mediocrity. Poor or inadequate guidance, ignorance of tenure procedures or expectations, or a lack of understanding of the "rules of the game" can result in major problems and, we believe, leads to as many failed tenure bids as poor performance.

In our own schools, we have tried to foster an atmosphere of support and encouragement for tenure track faculty, providing information and guidance about developing a scholastic career and creating opportunities to excel. As members of ACSA, we would like to see an institutionalization of this approach, both in the generation of new opportunities to achieve peer approval (the New Faculty Teaching Award, for example) and in the dissemination of information that can help a faculty member chart a successful route through the tenure maze. This handbook is an attempt to achieve the latter.

We should add that the concept of faculty development transcends the arbitrary seven year tenure period. We believe in the growth and development of each faculty member over a lifetime and do not see the striving for excellence waning after tenure. For this reason. we hope the contents of this handbook can be useful to all faculty in their professional development and can help to set the foundations for a long, fruitful and outstanding academic career.

Bob Greenstreet
Dean, School of Architecture and Urban Planning
University of Wisconsin–Milwaukee
Past-President, ACSA

Marvin Malecha
Dean, School of Design
North Carolina State University
Past-President, ACSA

Responsibilities

1. RESPONSIBILITIES

The life of a junior faculty member is at best an uncertain affair. Generally one step out of graduate school, this group is often assigned heavier coursework, more committee tasks, expected to publish and/or present papers and conduct research or creative activity. But, that is not all. Frequently, this difficult workload is conducted along a perilous path strewn with examples of past failures, the politics of appointment and promotion and demanding academic fields, which require constant study to remain current. The compensation is personal gratification and often near poverty level salaries.

Perhaps this picture is rather exaggerated, but it bears sufficient elements of truth that we should begin to reflect upon change.

The junior faculty are a valuable resource for any program. Not only does this group generally bring freshness to an academic curriculum but as a group, they are usually more racially and culturally diverse and often provide a better balance of women and men. The junior faculty represent an investment in the future of a program. More than any other single decision, the choice of an individual sets the pattern for curricular decisions and philosophical underpinnings. Therefore, it is imperative that the choice of these individuals and the means by which they are nurtured, promoted or even sent away must be founded upon information and practices beyond departmental politics and personalities. Both the junior faculty member and the individuals representing the institution have responsibilities to fulfill in order to ensure a successful conclusion.

1a. The Academic Environment

The environment is the defining aspect of where a person works, his or her productivity and the quality of the academic experience. While facilities are an aspect of this, it is more of an operational philosophy comprised of understanding, respect for ability, inclusion, and a holistic concept for the institution. This may be best characterized as a nurturing attitude.

Understanding is an important aspect of this matrix, since it allows for mistakes. We all make mistakes and often learn best when we do. So it should be with a new faculty member. Potential situations for growth should

not be manipulated into problems. In a "free and ordered" environment, individuals may hold their own opinion without fear of retribution. Such an opinion should be defensible, otherwise it cannot contribute to a mature discourse. We must not seek only those we can agree with or those who only advocate a single point of view. The university demands diversity of thought and interests—it is, therefore, a model for a rapidly evolving culture.

Respect among colleagues for ability is fundamental to the discourse of the university. Respect is the basis upon which trust will develop. Junior faculty must be given assignments and roles within the academy based upon the ability they bring to the institution.

Inclusion is a fundamental aspect of a true faculty community. Much too frequently, artificial divisions are drawn among junior and senior faculty, creating problems of trust, respect and understanding. Certainly, there are issues in the life of the academic department that will not be inclusionary by nature and are therefore inaccessible to the junior faculty. These situations should be minimized. Inclusion in the discourse upon the issues before the department, college or university is the first tangible sign that the opportunity for success is present.

A holistic concept of the department and the curriculum is necessary to provide the individual with a clear understanding of his or her place in the plan. It provides the department and the faculty the opportunity to take advantage of strength while addressing weakness. A holistic concept of place, program and people is the essential ingredient of clarity, when both institutional and individual responsibilities are clearly understood.

1b. Institutional Responsibility

The faculty recruitment, promotion and tenure process must be characterized by clarity, which is first reflected in the development of the job description and amplified in the recruitment and hiring process. If this process is successful. then almost every other subsequent decision will be much less painful for the institution and more straightforward for the individual under consideration.

This clarity should be further articulated in teaching and committee assignments. Certainly, it is upon the shoulders of the department to define what is expected of new colleagues. Written reappointment, tenure and promotion guidelines are the rule today, but even these documents tend

to equivocate. While it is impossible to construct a document that anticipates every situation, it is reasonable to consider making a basis for action that articulates what is expected. How much teaching will be required and will it be necessary to assume a major curricular responsibility? How many administrative duties will be required to be considered a full participant in department life? What is the nature of the scholarly and creative pursuits that are expected to be a successful candidate for a more consequential position?

Clarity implies honesty and strength of convictions. Honesty requires openness, while strength implies rigor. If an open attitude can be maintained, then a new faculty member is not working against unknown factors. With such an exchange, an individual in the reappointment, tenure and promotion cycle may begin to address weaknesses that become apparent

The process must be rigorous for it to have any meaning. Such an approach minimizes the political nature of appointments and promotions within a department. After all, the question is not whether an individual will vote in a particular way or even if everyone gets along with that person. The process should remain focused upon the individual's demonstrated ability to satisfy the needs of the position first articulated in the search process, the special knowledge and skill an individual brings to the position, the value of the individual to the institution, and specifically assessed examples of performance. Further, the process must be so disciplined as to begin the moment the new faculty member comes onto the campus. All too often, the important evaluation comes too late in the process for the individual to respond.

A variety of means have been recommended for such a process to be successful, from mentoring to faculty development programs. However, ultimately such a process is the responsibility of the department chair. (In some cases, this maybe the Dean. In either circumstance, the latter should demonstrate an active interest in faculty development and thus set the standard in the department.) In addition, senior faculty members constituting an Executive Committee must all consider themselves veteran advisors who have a responsibility to assist in the process, but for continuity to prevail, such energies must be directed. Continuity is an important operational word since it is often a problem in the process. The expectations required of a faculty member cannot be modified radically each year. When such behavior occurs, it is impossible to be rigorous since a substantive response to criteria cannot be demonstrated.

So, how can the departmental chair best serve the interests of tenure track faculty? Providing direction and advice throughout the process, possibly by regular meetings at least once a semester is an enormous help. Similarly, pointing out opportunities (conference presentations, grant possibilities, high profile committee assignments, etc.) and, whenever possible, ensuring a favorable workload that enables the individual to develop to the standards required by the department.

However, this is not a handbook for administrators; attitudes towards junior faculty vary from school to school and from person to person and the chair position may be occupied by a variety of individuals during one individual's tenure track period. How can the junior faculty member then ensure that he or she gets the best from their chair? This may prove to be a little sticky if the chair seems unwilling to help, but diplomatically engaging him or her in the individual's development is not impossible. Asking for advice, keeping the chair informed of your concerns, your achievements, your ambitions, requesting more feedback (on teaching performance, on abstracts and proposals, etc.) helps to bring them into your comer as an advocate, a mentor and, hopefully, a friend and colleague.

The same principle applies to senior faculty. Not only do they usually have a significant say in the promotion of junior faculty, they also collectively hold a great deal of knowledge concerning academic advancement—after all, they have already successfully straddled the tenure hurdle. Incidentally, while the authors maintain that it is the responsibility of senior faculty to take an active developmental role in the careers of their junior colleagues, the latter may have to take the initiative in initially seeking advice and establishing a relationship.

Top Ten Ways a Chair Can Help Junior Faculty

1. Make sure they don't get dumped on in the teaching schedule—no continuously heavy loads, development of lots of new courses, constant teaching "in the trenches" (e.g., undergraduate core courses).
2. Make sure they get the opportunity to develop new courses that correspond to their scholarly interests, perhaps graduate elective courses, graduate studios, etc.
3. Whenever possible, provide release time or summer funding to help them establish a research agenda or develop a better teaching profile.
4. Nominate them for awards, high profile committee assignments and similar opportunities for recognition or advancement when appropriate.
5. Drop them notes on research grant opportunities and deadlines for receipt of abstracts, and encourage them to apply. Be generous with travel funds if they succeed.
6. Offer to read papers, review abstracts, etc., and provide feedback.
7. Meet with them regularly to informally chat about the tenure process and their progress.
8. Advertise their achievements through the *ACSA Newsletter*, to the Chancellor, the local press, campus publications, and send them notes of congratulations when appropriate.
9. Introduce them to potentially useful contacts in the city, on campus or at ACSA events.
10. Encourage senior faculty to work with them as well. In some cases, a structured mentoring program or three-person development committee can be helpful. Some schools require a formal "Progress Towards Tenure" advisory review at the tenure mid-point, which can be very helpful to the individual.

1c. Individual Responsibility

While it is hoped that institutional commitment will provide the framework for support for new faculty from their first semester, this may not always be the case, and the individual should be prepared to take the initiative in formulating a career strategy. The individual must realize that a probationary period in any position is used to determine whether they can fit into the whole life of a department, as well as satisfy specific course needs. This is especially true in a small department. Proof of the value of an individual to an institution remains with the individual. Here, clarity is important. The candidate should specifically respond to the requirements of the position, citing demonstrated outcomes as a result of participation in institutional activities or of particular activities relating to instructional responsibilities. A new faculty position requires a gregarious approach. This, more than anything else, will contribute to issues of institutional fit. Again, the individual can consciously reach out to other faculty regarding course development and position responsibilities without compromising personal integrity.

The reappointment, promotion and tenure process should be methodically addressed. An articulate record of demonstrated ability should be composed into a clear response to the position requirements and as a case for advancement. A candidate may utilize a career development plan connecting personal growth and professional growth with the expectations of the position. Connections between teaching and creative activity and research are becoming increasingly important (see Section 3). Specific references to individual responses to evaluations should be noted for future reference. The individual should formulate a specific, written response, for the record, of student evaluations and a strategy for future actions. Demonstrating the ability to respond to situations as they arise is critically important

Generally, a candidate begins with high hopes and is regarded with enthusiasm. As time progresses, if there is no specific program to follow or rigorous assessment of performance, even the most promising individual can drift away from a successful path. Even in situations where the institution is not successfully managing the process, a candidate can focus the discussion by articulating the demonstrated performance necessary for successfully performing in the position.

The First Thing to do as a New Faculty Member

1. Get hold of the departmental and university regulations on tenure and promotion and read them.
2. Read them again. Discuss the contents with other tenure-track faculty and senior faculty, if you have questions.
3. Ask for regular meetings with the Chairperson or Dean (once a semester) to discuss your progress, solicit advice, etc. Keep notes.
4. Start collecting anything that maybe useful for your tenure document—letters of thanks, articles in newspapers about your work, letters of support for your work—and put them in a secure file, cupboard or box. Back up computer files with hard copy.
5. Keep your eyes open for conference opportunities, grant proposal possibilities, etc., that look useful. Ask your colleagues' advice on deadlines and the best opportunities to pursue.
6. Don't panic. It isn't necessary to do everything in the first year, just familiarize yourself with the territory. Planning your tenure track is a useful exercise, however, and shows long term planning and commitment.
7. Try and get to conferences if at all possible. Finances may be tight, but networking in your field and developing a contact base of colleagues beyond your home institution can be invaluable.
8. Remember why you took the job in the first place—presumably you love to teach. That's a good place to start developing a reputation for excellence.

Opportunities

2. OPPORTUNITIES

2a. Institutional Opportunities

Among the most important decisions that an institution can make is the selection of a new faculty member. It is very important that when such a decision is made, it not be flawed by controversy and half-heartedness. Experience demonstrates that the failure of an appointment may be caused by the conditions that exist *before* the new faculty member even arrives.

The institution, therefore, must ensure that the conditions for success exist before people are asked to make a serious commitment to it. Simply stated, the individual who accepts a position is entitled to the opportunity to succeed. For this reason, the institution must accept *a proactive role* in the career of a new appointment. This takes on the form of proper academic assignments, support for creative and scholarly activity and reasonable assigned duties. Frequently, junior faculty are overly assigned committee duties, heavy student counseling and new course preparation, thereby leaving little time for creative and scholarly activities. Such a practice subverts the quality of in-class performance, while preventing the individual from accomplishing the body of work necessary for retention, promotion and tenure. Therefore, the leadership of the institution must see to it that junior faculty are properly assigned and their performance is fairly reviewed. Too often, senior faculty pass the ritual of junior faculty overload on to the next generation simply because these were the dues that were extracted from them. Such practices must be discouraged if an institution is to advance. Finally, it is important to assess the performance of each individual, in terms of how that person is meeting the intentions of the position he or she has been asked to fulfill. All too frequently, one junior faculty member is matched against another, creating an unhealthy competition that rapidly degenerates into either a personality contest or a kind of department politics. In either case, it is usually academic excellence that is sacrificed.

The key to success in creating academic excellence lies both in clear guidance and the creation of opportunities. It is the institution that must ensure the opportunities for success, to provide every possible assistance in enabling each individual to excel. This may take the form of institutionally-based mentoring programs, teaching workshops or incentive grants to stimulate research. It may also include awards programs for demonstrated excellence in teaching, research or service. Such programs can be very

useful to tenure-track faculty, and may be directed specifically towards them. However, it is surprising how often these opportunities are missed by faculty, either by overlooking deadlines or even by ignorance of their existence. Hopefully, senior colleagues will point out the campus-wide possibilities, but junior faculty should take the initiative to find out *everything* that is on offer *and the due dates for submissions/proposals* so that decisions as to when to apply can be balanced with other obligations and commitments.

Similar opportunities may exist in each school or department or through the ACSA network (the New Faculty Teaching Award is a good example). However, be creative in seeking out other opportunities that correspond with your teaching and/or research interests. Are there funds or possible activities available through the city, through a local practice or through an associated field (IFMA, AIA, ASID, etc.)? Are there awards for which you are eligible through similar channels, maybe through another institution or a multidisciplinary field—for example, annual Popular Culture Conferences transcend many disciplines and have provided lively fora for paper presentations for many junior faculty.

In summary, institutional opportunities exist at many levels in a myriad of organizational structures. Some are well known and highly sought after (e.g. the Bruner Award, the Rome Prize), others more obscure but with promise for interesting advancement. Opportunities may take the form of grants, awards, fellowships, publication possibilities, exhibits—any number of vehicles by which the individual may advance their teaching, research or service. It may be left to the individual, however, to be open-minded enough to explore the wide spectrum of possibilities and to aggressively seek out such opportunities as they become available.

2b. Individual Opportunities

A major factor in the success of individuals within the academy is the ability to seize upon situations creating opportunity. Once the institution makes clear that success is possible, that an opportunity for a secure appointment exists, it is the individual who must live up to the trust and hope inherent in such a situation.

This is largely attitude driven. The process of gaining acceptance by more senior academic colleagues is almost always by accomplishment. This will almost certainly occur as an individual takes responsibility for curricular development and events related to the whole life of the community.

While the dilemma of over-assignment is real, the other perspective of total avoidance of "dirty" assignments can be a damaging stigma. Formalized agreements can ease this problem. Essentially, the individual must be perceived as someone who is maturing as an academic, gaining strength in a needed direction, as a contributor to the work and management of the department and as a creative force within the department. A self-constructed career development plan may be the best plan of action, especially when it is shared with respected senior colleagues.

The career development plan may then form the basis of an articulate tenure or promotion request by reflecting upon the relationship between teaching, creative activity and the expectations of the institution. This can be conceived as the development of a *case statement* (see Appendix C). This is an apt comparison, since the case statement is a brief that elaborates an opinion with specific citations defending the requested action. The preparation of a case statement requires diligent record maintenance, expert opinions regarding the specifics of the case and a well-written argument with illustrations. The case statement is the basis upon which a faculty member can advance and, therefore, must be the result of efforts by the faculty member begun the moment he or she joins the institution.

2c. Making the Case

So what is the case statement and how can it help? Essentially, the case statement is akin to a legal brief, a well-argued, well-supported document that makes the case as to why the individual meets the criteria for job tenure and promotion. However, the case statement, while a powerful tool (in association with a curriculum vitae) in focusing the attention of those in judgment, can have much greater use if developed *early* in the tenure process. By attempting to define the individual's field and niche in the department and then demonstrating how he/she is achieving (and will achieve) excellence, the document becomes an excellent foundation for self awareness, showing how much the individual has achieved, and how much remains to be done prior to tenure. More importantly, it is an excellent vehicle for discussion with senior colleagues and administration—Am I on the right track? Am I correctly sensing the needs of the department? Is my progress satisfactory?

Regular, annual updating of the case statement (which needn't really be written until the second contract year) and requests for feedback from colleagues can provide useful information and suggestions, advanced warning if there is likely to be a problem with your progress, direction or ideology, and can prevent nasty surprises during the sixth year when it is too late to change strategies (tenure review during the sixth year presumes a seven year tenure track, with the final year reserved for notice, if necessary). The case statement becomes a "running contract," constantly informing your colleagues of your progress, enabling ongoing feedback and giving you an indication of how to balance your activities and pace your rate of progress over the tenure track period.

What does the case statement contain? The first paragraph should be a concise description of your field of expertise within the broad discipline of architecture. This may be a lot more difficult than it sounds, and can require some introspection on what it is you actually do. Many have dabbled in different areas over a period of years, working with community groups in Mexican border towns, undertaking research on Chinese mosques and developing theoretical constructs applicable to the design studio. Getting to work on the case statement helps to bring together such activities (if possible) in a way that defines your niche in the department and the field. Alternatively, if started early enough in an academic career, it can highlight a scattergun approach to scholarship that may need some rethinking. Such evaluation is much better several years prior to tenure rather than during the final year.

Once the initial statement has been constructed—and it can be revised annually as you develop your career—the rest of the document becomes a statement of proof as to how you have met (or will meet, in the case of a statement developed early in the tenure track process) the criteria for excellence in the categories of teaching, research and service. It provides a collective summary of achievements culled from the curriculum vitae and demonstrable proof of their quality—which is the difficult bit.

2d. Making the Grade

How do you judge quality in achieving tenurability? When have I done enough? How many articles do I need? Why does my left eyelid twitch uncontrollably?

These are the questions typically asked by junior faculty at the Junior Faculty Workshops, understandably searching for a clear, quantifiable standard to achieve. Unfortunately, it is rarely that easy and, in a field as diverse as architecture, probably not very desirable. Some disciplines, notably those in the natural sciences, have attempted to quantify quality—this is why they are doomed to wear pocket protectors for all eternity—and in doing so limit opportunities for their junior colleagues to excel. It is all very well specifying the only journals in the field worth publishing in, the only institutions worth getting grants from, but dreadfully limiting if, for example, the turnaround time for an article review is eighteen months (another year, if accepted, before publication) or a national granting agency decides to drastically cut back its funding in your field for an indefinite period, a phenomena all to depressingly familiar in the past few years.

Of course, individual campuses and departments will have their own means of assessing quality, but it is the experience of the authors that quality of an individual's work and contributions can be proved by a variety of indicators.

1. Peer Review

Obviously, the best way to judge an individual is on the opinions of his/her peers. If the respected names in your field approve your work, that is convincing evidence of ability. The best kind of peer review is the one that looks just at the work, not the individual, removing potential bias through friendship, previous contact, possession of incriminating photographs, etc. Blind peer review of articles for scholarly journals, papers or abstracts for scholarly meetings, and nominations for awards and substantial research grants carry great weight at tenure time and should be sought as a primary form of evidence.

However, do not focus *exclusively* on the best journals, the major granting institutions and international conferences. There are a myriad of other opportunities in lesser journals (professional journals, newspapers), other grant-offering organizations (your graduate school, local institutions) or other conferences (regional ACSA) that can provide useful outlets. They are not as prestigious, perhaps, but *collectively* a hierarchical range of peer reviewed papers, articles, etc., nested together in a document, demonstrate a high level of activity and a *cumulative* quality of work.

2. Peer Approval

While blind peer review is undoubtedly the best form of recognition. do not eschew approbation for *yourself* rather than just your work. You may be invited to chair a seminar, to write an article, to give a lecture or attend a jury at another campus. In these cases, it is *you*, rather than an example of your work, that is being selected based, presumably, on your reputation. This is good news, as invitations, while possibly tainted by the suspicion of friendship or patronage, demonstrate your worth to the field. Again, you are looking to present a *pattern* of activity. One lecture or one workshop may not be convincing proof of quality, but if there is a cluster of such peer approval-related activities at a variety of venues, they can add a convincing dimension to the case statement.

3. Dissemination

As part of developing an argument that substantiates the excellence of an individual, the notion of worth must be included. All too often, discussions revolve around the number of articles or the quality of academic press while the *real* issue should be: how is this individual affecting and improving his or her field of expertise. In addition to peer opinions, the extent to which your work has been disseminated demonstrates your potential influence. Papers presented at national or international academic conferences can reach hundreds of colleagues and transfer knowledge, opinion or interpretation. Lectures at other institutions reach many students. Published work, of course, can reach even greater audiences, depending upon the circulation of a journal or the distribution of the proceedings of conference.

Dissemination of knowledge need not be restricted to your peers. Articles published in professional magazines (*Progressive Architecture*, *Wisconsin Architect*, etc.) reach out to whole other audience, as do presentations to AIA chapters or other professional meetings and conferences.

Illustrating your contact with the professional arm of architecture, in association with the academic one, can reveal a rich output of work to a variety of audiences. The public and allied fields should not be forgotten, and a useful record of all lectures, newspaper articles and presentations to civic groups, local or state governmental agencies and community associations should be kept.

4. Demonstrable Impact on the Field

While articles, grants, books and the like all attest to an individual's quality and are good indicators of success, give some thought to other, less conventional, proof of your impact on the discipline. Has the syllabus of one of your courses or one of your papers been used in some way in the curricula of other institutions? Have you been asked to consult or provide assistance on the development, say, of new state legislation or a policy paper by a local governmental official? Has a building you designed been used as a prototype for a new low-cost development in your city? In many ways, each quality person adds to the field of knowledge, changes attitudes or the way things are done and leaves a continuous mark on his or her field. ("It's A Wonderful Life" provides an extreme and rather bilious example of this concept.) Your job in pulling together the case statement is to clearly articulate your influence at a number of levels and provide convincing proof of your involvement.

Similarly, in planning an academic career, bearing this concept in mind can help a junior faculty member to prioritize in selecting the right balance of opportunities that will be presented to you during tenure track. Some tasks, be they written presentations or reports, consultations or design projects, may be very time consuming and yield little overall impact to the development of an academic profile. Others may be relatively easy and fast but have the potential of great impact on the field. Careful selection of directions and tasks can help in pulling together the best range of activities that serve both the interests of the individual and the field.

It must be stressed, however, that this four-part breakdown of indicators to demonstrate worth is a very personal one shared by the authors. Criteria for promotion vary considerably across a campus, let alone across the country, and the criteria may be much more rigidly and narrowly defined in your school. *Don't make the mistake of following this advice without checking with your colleagues first*. However, if our model is not entirely appropriate to your situation, it can be useful at the very least in opening a dialogue with your colleagues and administration as to how it differs from their expectations, and in clarifying for you their specific expectations of your performance.

Questions Relative to Retention, Tenure and Promotion

Although such a complex matter as retention, tenure and promotion should not be over-simplified, it is often evident who will succeed or fail at an institution if basic matters are approached directly. Therefore, a series of questions follows using a loose interpretation of Bloom's taxonomy of educational objectives.

1. Knowledge

a. Does the individual exhibit a broad knowledge of the history, theory and methods of the discipline, even when the teaching area of primary responsibility is most specialized?

b. Does the individual exhibit the knowledge necessary to perform successfully in the context of the institution?

2. Comprehension

a. Does the individual exhibit the ability to explain clearly complex concepts in formal learning situations such as the classroom and in informal situations such as studio critiques?

b. Does the individual exhibit the understanding necessary to interpret and translate information into new forms of knowledge?

3. Application

a. Has the individual demonstrated the ability to apply knowledge through practice, research or creative activity?

b. Has the individual demonstrated the willingness to work in service to the university and to the community, utilizing special abilities unique to the creative mind?

4. Analysis

a. Has the individual demonstrated a commitment to inquiry?

b. Is the individual able to compare and assess alternate opinions and approaches in the creative process?

5. Synthesis

a. Has the individual been able to combine experiences and information into a personally significant opinion that may be shared and properly defended?

b. Has the individual been able to grow beyond the influence of others—beyond discipleship into professorship?

6. Evaluation

a. Is the individual able to conduct practice, research, creative activity and teaching in a reflective fashion?

b. Is the individual able to constructively accept the comments of students, faculty colleagues and professional peers?

c. Is the individual able to make constructive judgments?

In most simple terms, these questions ask: what does the individual know, how clearly can he or she articulate those ideas, what has been accomplished, is there a willingness to work with others and will he or she mature into a leader. This is what the retention, tenure and promotion process in a university is all about.

Balancing Teaching, Research & Service

3. BALANCING TEACHING, RESEARCH AND SERVICE

3a. Making the Connection to Teaching

Perhaps the most important aspect of the reappointment, tenure and promotion process should be the results of efforts in the studio or classroom. The performance of an individual and the demonstrated learning outcomes build a case in favor or in opposition most convincingly. The results of teaching can provide the faculty member with student and peer assessments, as well as a body of student work and related course materials, such as outlines and handouts, which will demonstrate a pedagogical approach; such work complements research and creative activity and can present a powerful impression if assembled in a well-developed teaching portfolio. Therefore, the individual should carefully construct course outlines and course materials to properly reflect an attitude about teaching. Faculty should continually seek the connections between their own intentions and the products of academic coursework. In the most simple terms, it is reasonable to demonstrate personal opinions and attitudes both about teaching and the discipline of architecture through the work of students. However, some caution is necessary in this matter. The work of students cannot be construed so personally as to inhibit the necessary exploration and learning processes inherent in the work of a student.

There are several aspects of course materials that will be helpful in demonstrating the value of an individual in the reappointment, tenure and promotion process.

1. The value placed upon scholarship and inquiry.
Indicators of such activity include reaching across disciplinary lines, not only within allied disciplines, but across the university and into the profession and the community.

2. The value placed upon integrative strategies.
Indicators of such activity include reaching across disciplinary lines, not only within allied disciplines, but across the university and into the profession and the community.

3. The value placed upon action.
Indicators of such activity include those projects that cause students to apply concepts introduced in coursework.

4. The value placed upon diversity.
Indicators of such activity include the application of research methods, creativity, seeking broad knowledge in precedent and general encouragement for the development of opinions that may be clearly defended.

5. The value placed upon the learner.
Indicators of such activity include the ability of the instructor to adjust to varying situations and individual needs. This includes a willingness and an openness to student interaction.

Course materials that contain these elements will become valuable components of a career development plan and useful in the preparation of the case statement. After all, even in the most research-oriented university, the individual who can demonstrate value in instruction is hopefully among the most viable candidates for success.

3b. Juggling the Big Three

One of the interesting challenges facing a junior faculty member is the relative emphasis he or she should place on teaching, research and service. It is fair to say that, on many campuses, research and scholarly activity are going to be the predominant criteria for gauging success, with teaching ranked second and service a distant last. This is not necessarily a fair ordering that serves the interests of the individual or the department and negates the opportunity to have a balance of great researchers, great teachers, etc., but in many instances it reflects reality and, as such, must be dealt with.

The preceding text has dealt at length with excellence in scholarly endeavors, but how best can a junior faculty member achieve the necessary accomplishments in research while becoming a valuable teacher—an activity that may have attracted them to academia in the first place? Essentially, a balance needs to be struck that enables the individual to do what she or he does best, but which ensures long term career development. There is a growing emphasis on quality in undergraduate teaching in the United States at present, but many campuses will not give tenure based solely on excellence in teaching. This is not to say that the teaching function can be abrogated; faculty who concentrate too heavily on their personal research to the detriment of teaching are likely to lose the support of their colleagues as their usefulness in the department wanes. Consequently, a balance needs

to be struck that ensures that the long-term developmental interests of the individual are met, that the needs of the department—particularly the students—are well served and that the prescribed criteria for tenure are being adhered to. This requires good planning, ongoing communication, negotiation and some ingenuity.

3c. Developing the Plan

A new faculty member, fresh to the profession, is likely to be pretty well swamped with teaching responsibilities in the first year, developing teaching skills, writing lectures and building a constituency among the students. This is wholly appropriate. There are six years ahead to achieve the necessary accomplishments for tenure, and trying to do everything in the first year is rarely successful. However, developing an overall plan for the tenure track period makes a lot of sense. All too often, an enthusiastic faculty member develops great new courses, throws him or herself at teaching and can then find three or four years have passed without a coherent academic agenda in mind:

Establishing a yearly plan is a useful exercise that works back from the tenure date and sets out personal goals that bring together teaching, research and service. Year one, for example, may be focused most on teaching, developing a new, graduate level course, picking up the load in the core studios and generally familiarizing oneself with the primary teaching role. The summer and subsequent year may add newer dimensions, planning to submit several abstracts or a grant proposal, entering a design competition, etc., and becoming more involved in university, professional or civic activities, and so on. Each year can build upon the last as a coherent package of activities that yields several benefits. Firstly, the plan provides a vehicle for discussion and negotiation with the departmental administration, helping to create a meeting of the minds as to matching individual and departmental needs, and helps to prevent unpleasant surprises or confrontations years later. A written plan, filed with the administration, can also be useful to ensure continuity of treatment if administrations change. Secondly, the plan can be evaluated each year to see if the direction, progress, annual goals and balance of teaching, research and service are still appropriate. Revision can then take place if necessary.

Thirdly, a workable plan can have the added benefit of trying to blend the activities of teaching, research and service into a coherent academic

whole rather than as three distinct activities. If one's teaching schedule can be developed to reflect research interests, if service activities can correspond to a general academic thrust, the combination of activities and achievements in the three areas will form a strong argument for quality where the whole exceeds the sum of the parts. This process can be advanced further through the concept of "piggybacking."

3d. Piggybacking

If a faculty member's teaching, research and service profiles can be developed coherently in a singular pattern, the indicators of success in each can be transferred between them. For example, student work from a course or studio can form the basis for an exhibition, a website or a booklet. It can be submitted for awards (bringing reflected kudos to the faculty member and department), published in local newspapers or journals, and be the focus of an academic paper. Similarly, service activities—working for an inner city community group—may generate small grants or local recognition and the results of the work could be expanded into a paper or article. Research findings can be folded back into the classroom in the form of coursework or be disseminated to the profession in the form of workshops, lectures or articles in professional journals.

In this way, even the lowly service component can be transformed into peer approval or peer reviewed vehicles that help to fulfill tenurability (see Appendix B).

This approach, which requires both flexibility and ingenuity, helps to elevate the important teaching and service functions of a faculty member by transforming the results of their work into more conventional means of enquiry. It enables an individual to concentrate on doing what they want to do, and probably do best, and yet still develop a coherent career profile with the criteria for continuation firmly in mind.

3e. Pitfalls in the Process

Tenure is a rigorous, nerve-wracking and occasionally arbitrary process of assessment, and we are all familiar with tales of failure. Several pitfalls can be identified which have helped to create the hazardous path to tenurability, and should be given careful consideration:

1. Teaching, Teaching, Teaching

The reason you came into academia was probably a predilection for teaching, possibly learned as a teaching assistant. This is highly creditable and great news for your students, who will benefit from your enthusiasm and commitment. You may volunteer (or be volunteered) for the "grunt" courses, willingly develop a slew of new courses and spend every available hour in your studio. Your students will love you and your colleagues are happy that you are taking the brunt of teaching requirements.

However, be careful. The last thing the authors want to suggest is minimizing your teaching. Junior faculty are often the lifeblood of a department and bring freshness, new ideas and vigor to the classroom and studio. But the sobering truth remains that very few faculty ever receive tenure on teaching alone. Typically, good, solid teaching performance will be appreciated and rewarded but it needs to be backed up with a healthy scholarly profile during those first few years.

Does this, therefore, mean that a great research profile but rotten teaching performance will guarantee tenure? Probably not. Departments have to meet their teaching needs and will not appreciate poor or reluctant performance. It is likely that they will require at least adequate teaching abilities—not necessarily excellent—to continue.

As you plan your tenure track, work out and negotiate your teaching load, if possible. Sure, develop new courses that are within your sphere of interest, become a teaching backbone of the department, but keep your long-term development in perspective. No one is going to thank you for developing ten new courses five years from now. Of course, when you have tenure, a greater emphasis on teaching becomes much more feasible without the threat of ejection hanging over your head. Bear that comforting thought in mind.

2. Getting off the Track

Career planning is important because it provides the basis for deliberate choice. As opportunities become available, it is necessary to chose between them and select those that conform to your long-term goals. To jump at enticing activities without thought to their overall, collective value may be fun, but can lead to a rather incoherent tenure package down the line.

It should be stressed that planning should not be substituted for personal development goals. Don't take a direction or do a piece of work that takes you away from your chosen path. You'll hate doing it and probably do the work badly. The issue comes up most with professional practice-focused faculty who feel they must become researchers. They abandon their design ambitions and start turning themselves into theoreticians, number crunchers, etc., often without the training to do so. They are not happy people, and often not very successful either.

It is the authors' belief that enquiry through design is a perfectly legitimate means of achieving excellence in the field of architecture—the reflective practitioner is an important part of a successful department. However, it is a little more unconventional, and the onus is often on the individual to prove the comparative worth of their achievements to the more traditional vehicles. Some campuses allow for "creative activity" as an equivalent to research and scholarship. This does not mean that conventional practice necessarily counts—six Burger Kings, three warehouses and an extension to your garage is not exactly cutting-edge stuff. It is up to the individual to demonstrate excellence through the usual channels—peer review, peer approval and dissemination. This can be achieved by winning competitions, national or state design awards, exhibitions of work and articles on your work, all demonstrating your quality and the approbation of your peers. Similarly, built work can become the focus of a scholarly paper at an ACSA meeting or an article in *JAE*, if they are used to substantiate and illustrate a particular line of scholarly enquiry.

In short, designers should follow their abilities and desires in pursuing excellence. They will benefit, as will their departments. To assume that a single model of a faculty member fits all circumstances is foolish, and a richness of contributions from faculty exploring different areas of design and research can only mean a stronger curriculum. However, faculty electing to take the design route must remain alert to the requirements of tenure and ensure their work conforms, or can be transformed, to the conventional mechanisms of proof necessary for tenure.

Strategies for Success

4. STRATEGIES FOR SUCCESS

Ultimately, the goal of any faculty member is to achieve excellence in his or her selected field. While the concept of excellence can be a little nebulous, the criteria are more specific and establish a framework of requirements through which the individual must pass. Here are a few guidelines to make the journey a more fruitful one.

4a. Finding a Mentor

The concept of mentoring is growing in our institutions. Some campuses have developed structured programs for junior faculty, while others rely on a less formal approach. Certainly, the advice and guidance (and protection) of a senior faculty member can be most helpful They can steer you in the right direction and work collaboratively with you (one word of caution—make sure not *all* your work is with your mentor or your personal contribution to the work may be questioned).

If there is no structured mentoring program and none of your colleagues has taken on the role, don't be afraid to seek out appropriate help, either among your own colleagues, in another department or another campus. Chose carefully and approach the subject diplomatically. Maybe just asking for some general advice at first, rather than an all-or-nothing, "Will you be my mentor?" would be best, so that a mentor/mentee relationship grows gradually.

4b. Building a Network

The concept of networking can have enormous value to the junior faculty member striving to jumpstart an academic career. Developing a network of friends and contacts in your area of interest both in your department, university and in schools across the country can yield a multitude of benefits. These contacts may become co-researchers on jointly conceived projects. They may become sources of letters of recommendation for you or perhaps will invite you to give lectures or attend juries. The network can contain prominent figures in the field or junior faculty like yourself—collectively, the group enables you to talk about your work, to share opportunities or to seek help when appropriate.

In some fields, these networks are well established, while in others they may require some effort on your part. Attendance at appropriate meetings and conferences is probably the most effective means of meeting like-minded individuals, although letters, phone calls and e-mail provide the means to keep in touch. Asking a colleague to read a draft of your paper, asking him or her for a copy of their latest article are all perfectly legitimate ways of priming a relationship at the outset, and many distinguished faculty are only too pleased to correspond with colleagues on other campuses. In some cases, the relationship can extend into a more defined mentoring process, but the network itself is an important component of academic career development.

4c. Pacing Yourself

One possible downfall of exploring the realities of tenure—such as reading this handbook—is an increased sense of panic in the face of the rigorous challenges ahead and too much focus on the tenure process instead of academic excellence. It is important to stress that early knowledge of the process and long-term planning should *minimize* the need to worry about the procedures and free up more focused time for teaching, research and service. In this way, there is no need to run at the process like a maniac and risk either burning out early or doing a little of everything poorly. Set your schedule (with full consultation, of course); remember there are six long years (tenure is not usually considered in the final, seventh year) and proceed calmly at a measured pace. And never look behind you (just kidding).

4d. Selling Yourself/Building Your Reputation

The faculty network can be extremely useful in the task of building a reputation and letting everyone know what you are doing, but don't be bashful about letting others closer to home know, too. In a busy, active department, it is fair to assume that your colleagues won't know everything you are engaged in, so be prepared to let them know—diplomatically, of course. Presenting your work in a faculty forum, exhibiting your (or your students') work in the building, sending them copies of articles for their information/review are all useful ways of demonstrating an active agenda. Regular meetings with your chair can also be helpful in keeping him or her abreast of your achievements.

Extending this strategy to colleagues beyond the department may also yield some results (the *ACSA Newsletter*, for example) although some may

be uncomfortable with the notion of blowing their own trumpet. You should use this strategy, therefore, only to the degree to which you are comfortable with it.

4e. Don't Panic

Remember the Ford Foundation proposal you spent the summer writing? The design competition you spent countless hours preparing? Both rejected—a complete waste of time, God, I'm a failure, where's the Prozac, where's the brandy, where's my mommy?

Well, hold on, nothing is *ever* really wasted and the last thing you can afford is to panic or despair. Look at the work you've completed and see what can be salvaged. Can the proposal be revised and resubmitted next year? Can it be sent in a modified form to other agencies? Can it even form the genesis of an article, a conference paper or a blog? Sure, nothing beats the buzz of a major grant, but the work can be transformed into alternative means of enquiry with maybe less clout but still a demonstrable impact.

Similarly, the competition entry. Can you submit copies for publication in an appropriate journal or exhibit them? Can they form the basis for a paper on design enquiry? Can they be effectively displayed on the school website? Be creative in assessing your work and you will find that almost nothing is a complete waste of time.

4f. Keep Alert

There are countless opportunities available to academics through their departments, universities, cities, professional or scholarly organizations or other institutions. Stay alert and open to them by reviewing *ACSA News*, *The Journal of Architectural Education*, etc., and look for creative ways to pursue your work by any means available to you. Sometimes, the obscure journal or conference in Bolivia can carry a mystique that more familiar vehicles lack.

4g. Start Early

In addition to long-term planning, start building the file for the tenure dossier as soon as possible. The construction of the tenure document is a time consuming and tedious affair, and if you leave everything to Year Six, you will spend many happy hours hunting for lost articles, calling the editors of defunct newsletters and photographing deteriorating buildings while the deadline rapidly approaches.

Set up a file, or a box, right away and start collecting anything that may ultimately be useful. That newspaper article on your studio work? Keep it. That letter of praise from the mayor? Put it in. Keep extensive computer files but back them up and keep hard copies separately. Maybe you'll omit these from the final document, but at least you'll have the option of choice, and remembering *everything* you've written, drawn, said or had said to or about you six years after the event is just about impossible.

Also, begin to qualify and define your work. If you co-author a paper or book, get a letter from the co-author specifying the extent of your contribution. If your work is selected in a competition, find out who the jurors were, how many entries were rejected and how and when the work will be disseminated and/or displayed. If you publish an article, call the editor and find out the circulation, rejection rate and names of editorial board members—all useful information which may be required in the final analysis, so do it while it's fresh in everyone's mind.

Building the document from the first year is akin to preparing a student portfolio—the more work you do at the time, the less time you will have to spend at the end, the less likely you are to lose or forget significant pieces of "evidence" of your abilities/activities.

4h. Advice for When It Goes Wrong

During the course of a career in the university, it is inevitable that there will be a time when events will evolve to the disadvantage of a probationary faculty member. Such unfortunate circumstances may happen completely out of the control of all parties. Consider for a moment all that can go wrong in human relationships. Add to that the vagaries of fate, and mix in the probability for innocent mistakes and the occasional failure in spite of the best efforts and intentions. Given the reality of these occurrences, it would be naive to ignore the possibility of difficulty. Perhaps it is better to assume that everyone experiences a certain amount of failure and proceed to develop a strategy to learn from such situations and transform them into positive aspects of a case for tenure and advancement. Above all else, it is important to recognize difficulty when it arises. The tendency of the individual to pretend that problems either do not exist or will soon evaporate may be unfortunately optimistic in the case of faculty members under consideration for tenure, promotion or reappointment. There are measures that can be taken when the appointment process is not progressing as it should.

How am I doing?

The best measure to follow is to develop an open and regular rapport with the leadership of the program and the senior members of the faculty. The simple question, "How am I doing?" will give you an opportunity to solicit an informal assessment while letting senior colleagues know that you are interested in being successful

It doesn't feel right.

Trust your instincts when the situation doesn't feel right. Assess such a situation carefully and honestly without searching for fault. The problem may be within yourself. Personality conflicts and mismatches with institutions are possible. Equally, the problem may lie outside of the individual with the misconception of colleagues. Many times the source of problems resides in the original conditions under which the appointment to the position was implemented. Frequently, recent appointees represent the new direction of a department without knowing that such identification may mean trouble with senior members of the old guard. When it doesn't feel right, the best course of action is to articulate what is causing the discomfort and to undertake steps within the career development plan that address the situation. A regular personal assessment will enhance the efforts of the individual to meet the demands of the faculty. The individual must address the difficulty in the earliest stages of its formation to properly adjust the contribution to the department and to alleviate the situation.

The rules are changing!

Perhaps the most common cause of failure is the changing expectation of the role of a junior faculty member. Junior faculty members are often drawn into the many tasks related to an academic appointment. It is not unusual to find the junior members of a department accepting varying teaching assignments, difficult committee work, and extensive student advising responsibilities. These tasks detract from the research, publication, and creative activities that are expected in tenure, reappointment, and promotion decisions. Perhaps the most important strategy for improving a situation which is evolving toward difficulty is to determine, as much as possible, the definition of the teaching and committee assignments related to the position. Given clear expectations, it is possible to work toward mutually agreed upon goals for improvement and the support required from the department for success.

I have failed!
There is no doubt that failure will cross every path. Failure can appear in many forms: a lost competition, an unsuccessful grant application, the refusal of a proposal for publication, or poor teaching evaluations. When failure happens, it is important to remember that positive steps may be taken. Every university offers the opportunity to improve teaching, grant writing, and publication skills. Often the effort expended after failure demonstrates to senior colleagues the real value of a junior faculty member.

Such activity can be recorded and noted as a direct positive response to failure. The learning curve from failure is very high. The other aspect of failure is that it may indicate that the context for the work of the individual is unsympathetic. Certain institutions expect greater productivity in the area of research, while others are primarily teaching institutions. An individual desiring a career devoted to research will not fit well in an institution with heavy teaching loads. Should this be the situation, it may be advantageous to search for another position. It is better to take the search for a new appointment in hand from the relative security of a tenure track position than to be obliged to seek alternative employment in a terminal year.

I haven't been given the opportunity to succeed!
The opportunity to succeed is implicit in every appointment. Opportunity must be seized, but it cannot be withheld. Should the individual believe that the circumstances involved in the reappointment, tenure, and promotion process have not been fair, every institution maintains procedures to insure prevention of any form of bias or unfair labor practices.

While failure can be a difficult experience for an individual within the academy, the causes for it may be derived from many sources. Every failure of the individual is also a failure of the institution. Appointments are made with great hopes for success. When success is elusive, it implies a misjudgment of the selection committee, a breakdown of department support for junior faculty, or the inability of the individual to match expectations raised during the appointment process. In any case, strategies must be derived as fresh starting points from the point of failure.

It's Tenure Time—Getting Ready

5. IT'S TENURE TIME—GETTING READY

Well, six long years have flitted by and, suddenly, it's tenure review time. If you've been working hard and planning intelligently, this shouldn't pose any major problems for you. However, putting together the documentation and working your way through all the procedures is a time-consuming and potentially hazardous occupation, so some useful attention is warranted.

Of course, the tenure process is likely to differ on each campus, and requirements vary considerably. In some instances, the chair will exert an enormous influence on the outcome of each case. In others, departmental approbation will be critical, or a divisional committee (a faculty group drawn from similar professional disciplines) will present the major hurdle. Or maybe the Chancellor or Provost's word is everything. In any case, a clearly written statement supplemented with convincing evidence will be critical—something that fleshes out your curricula vitae and explains the whole person.

5a. Preparing the Document

- Check the requirements very carefully and discuss them with your colleagues. Do you prepare one big document/portfolio, or are smaller packages of information necessary as well for circulation to committee members? Look at examples of documentation by successful recent candidates from your department. Working from yellowing tenure documentation from the Jurassic era when criteria may have been different can give you a false perspective on current requirements.
- Bear in mind that those reviewing your work will be busy. Make sure that the documentation is *extremely* clear and unambiguous and that the material is easily accessible and corresponds to the curriculum vitae. Unclear and confusing files tend to annoy people, suggesting you either didn't spend much time on preparation, aren't very professional or aren't overly concerned about wasting their valuable time. This does little to foster the reader's benevolence towards you. Make sure, therefore, that there are *no spelling errors*, that magazines/proceedings have your work clearly tabbed and that files full of material are clearly indexed and explained and referenced back to the curriculum vitae.

- Show the document to as many friends as possible for advice. If they are confused by an argument or by the inclusion of a particular item, heed their collective advice. Even ask someone outside your discipline to review your stuff. Presumably your colleagues will know what you are doing academically, but other reviewers—divisional committees, Vice Chancellor, etc.—may not, and need to be led carefully through the material.
- If you are particularly inept at this sort of thing, hire someone to help with the word processing or the document assembly. Don't risk messing up this vital process for the sake of a relatively few dollars.
- Don't be afraid to over-explain a particular project or achievement if you consider it important. Don't assume that reviewers will be able (or indeed willing) to try and interpret some particularly dense text or shuffle backwards through reams of material to find out what you're getting at. Making it really easy for the reviewer ultimately makes it easier for you.

5b. Making the Pitch

In addition to a strong, clear persuasive case statement, accompanied by an error-free curriculum vitae and well organized document, a personal presentation may be required, either to the faculty or a campus committee. This is good, as it enables you to extend your personality into the case and clear up any lingering ambiguities. However, experience has shown that the meeting also presents a golden opportunity to put your foot in your mouth. This is, after all, a very stressful time and candidates have been known to become aggressive, overly submissive or incoherent in the face of questioning. Here are a few hints to consider before any of the meetings you may have to endure.

- If you're a nervous type or famous for your self destructive performances, hold a dry run the day before. Ask your most rigorous supporters to be the reviewers, give you hell, and ask you really challenging questions. You'll learn a lot from the experience on how to strategize your responses and the next day will be a lot easier.

- Prepare your comments clearly, don't just turn up and waffle. Use cue cards prepared in advance or even read out a prepared statement if you feel more comfortable. Use PowerPoint, visuals, etc., but practice integrating them into your presentation first. This is a crucial meeting (or series of meetings)—don't blow it by inadequate preparation.
- If it is permissible, take along A Champion. This is probably not necessary at the department level, but at campus wide meetings, the presence of one or two senior colleagues (or Hired Guns, if you like) can provide great moral support. They can give the departmental perspective, take the blame for any ambiguities in the document ("Sorry, we should have caught that before we brought him/her over.") and eulogize your achievements, thus saving you the embarrassment of blowing your own trumpet.
- If there is a delay between furnishing the document and presenting it to a committee, take along a supplemental sheet listing your latest accomplishments in teaching, research and service which are not included in your curriculum vitae. This allows you to alter the focus of the meeting at the start and can impress the reviewers by the continual thrust of your work. Remember to take enough copies for all the reviewers and yourself in case there are questions.
- Take *nothing* for granted. Before your document moves from the department to the next level, make sure all the articles, photographs, CD's, etc., have been returned to the right place in the next folder. Call and remind your accompanying colleagues of the time and place of the meeting the night before, just in case (Sound paranoid? One of the authors has vivid memories of making a frantic call to a senior colleague five minutes before the tenure meeting). Planning on showing PowerPoint? Fine—is there a plug point conveniently located, and a blank wall or screen? Can you achieve an adequate blackout? Should you take your own projector and computer? Best to check even the most mundane things beforehand so that they cannot become insurmountable obstacles.

In Closing

6. IN CLOSING

The success or failure of a faculty member is a shared responsibility between the institution and the individual. Either can fail to make the relationship prosper, thereby causing the prospects for tenure to evaporate. The only scenario that will bring a successful conclusion to the process is if both parties understand their respective roles, fulfill their responsibilities and actively work to maintain an honest and open working relationship. There are many reasons why the relationship can fail besides a lack of performance by the tenure candidate. In some instances, it is a matter of the physical context of the school, in others there may be an honest disagreement among personalities. These instances are, for the most part, unavoidable. However, it is possible to isolate difficulties in most circumstances so that problem resolution can take place.

What is clear is that for the reappointment, tenure and promotion process to work, both the institution and the candidate must expend considerable energy. And yet, after all, there may be failure. The effort is worth it; the risk of failure is only a by-product of continuing or building program excellence.

Each institution formulates standards for reappointment, tenure and promotion. These standards will be affected by local conditions and expectations. A university seeking to gain prominence will expect faculty to aggressively pursue research and publication activities. Certain state institutions remain focused upon the primacy of the teaching mission, while institutions that wish to maintain recognized levels of national and international prominence will expect work from faculty that receives such recognition. Given this perspective, it is obvious that, in many cases, junior faculty will be held to a higher standard than the senior faculty. While such a situation may not be entirely fair, it is a reality where program maturation and improvement is a priority of the leadership.

Various means are employed in the development of reappointment, tenure and promotion documents. In certain instances, a point system or minimum standards for the number of published articles may be employed. While such an approach may satisfy concerns about productivity and exposure, it is certainly not a holistic decision-making practice. A well-documented case statement may refocus the discussion upon excellence and significance of contribution, which is where it should be anyway. Point

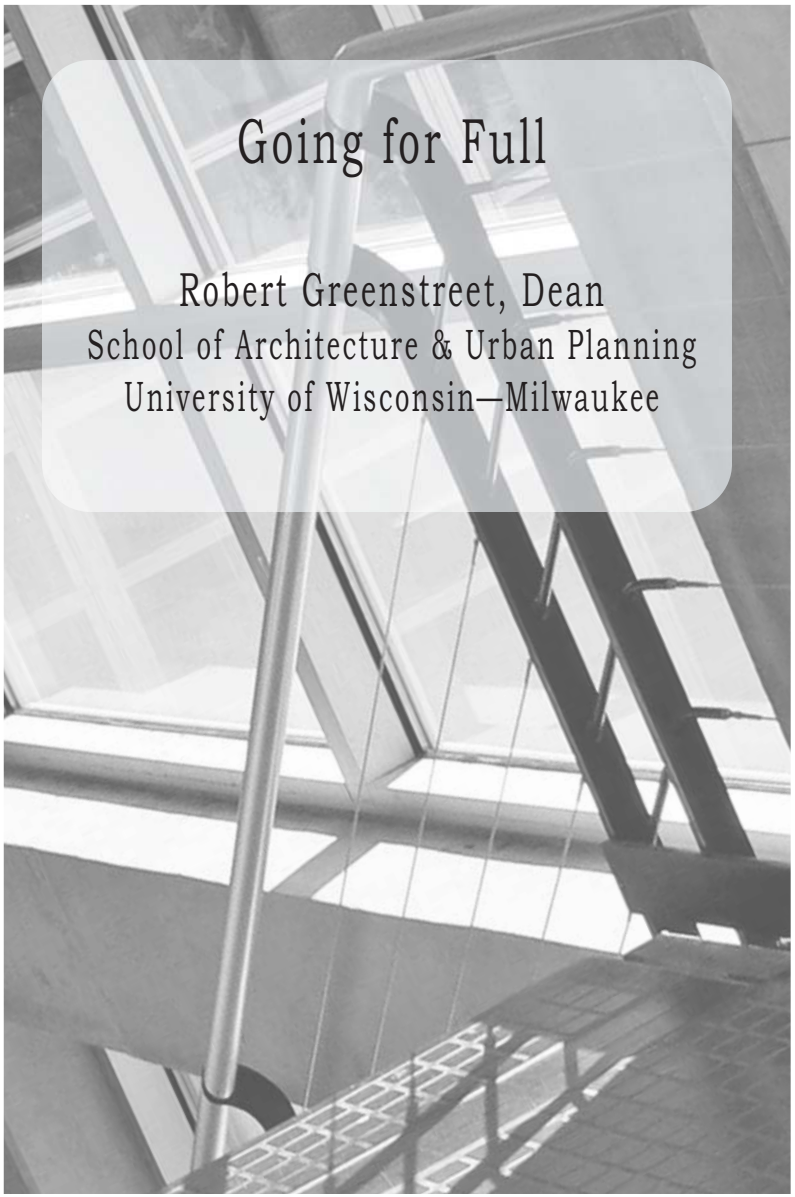
systems over-simplify a decision that must be made holistically. Therefore, the junior faculty member may shape this discussion by constructing a holistic case statement.

Finally, it must be remembered that this effort represents the future of an academic program. The lives of students and the collegial relationship of faculty members is what is at stake in this process. It has been said that granting tenure only ensures that an individual will not not make enough money forever. Maybe not forever, but if tenure is granted in the late 30's to early 40's, as it is in many cases, it is a 25-30 year investment—an investment that both parties should take very seriously.

Postscript

As we stated at the beginning of the *Handbook*, we believe that tenure is only an intermediate and often arbitrary hurdle in the development of a full, productive academic career—there are more peaks to conquer beyond a successful tenure vita. Accordingly, we include Appendix A, "Going for Full," a preparatory document that looks forward to the next level of excellence and achievement in your professional development.

Appendix A



Going for Full

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Going for Full

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While it may not seem so at the time, scaling the walls of tenure may be a little easier than going for Full Professor. The stakes are obviously higher in tenure track—up or out adds a certain piquancy to the process—although the criteria are pretty well established and the process clearly laid out, with a fixed timeline and regular evaluation benchmarks. It may not be fun, but it is defined, whereas the quest for the next level of promotion is far more nebulous.

When is the right time to go for Full? And more importantly, what are standards you should meet to attain that lofty, if vague, goal of a 'national reputation' that so many criteria demand?

In many instances it is the lack of clarity on these issues that creates a psychological barrier for many qualified Associate Professors that deters them from applying for promotion. In the Department of Architecture in the 1980's, for example, there were two Full Professors and seventeen Associate Professors, many of whom had been at UWM for fifteen or more years. Were they not good enough to go further? On the contrary, once we'd broken the log jam and created a process that positively encouraged promotion, all of the faculty demonstrated the sufficient quality to pass through the Departmental, Divisional and Decanal hoops to be successfully promoted by the campus and Board of Regents to Full Professor.

Here then are a few ideas on approaching the Full Professor hurdle. They may not be appropriate in all disciplines, but if nothing else, they may form the basis for discussion among you and your colleagues that will help to create a better understanding, and hopefully agreement, on the process ahead of you.

1. Get a Policy

   Proceeding through the academic ranks should be a smooth, constructive process where achievement is naturally followed by promotion. It should not be a lonely, personal struggle nor a divisive, internecine departmental battle, and it works a lot better if there is collegial agreement on the process. Remember, tenure requires asking senior colleagues to vote you up to their level, while Full Professorship means that you are asking some of your Executive

Committee—the Associate Professors—to elevate you above them. This requires a generosity of spirit in some instances that should be reinforced as clearly as possible with clarified and codified collective expectations. There are two issues that may bear discussion:

a) What is the standard we are seeking?

In some disciplines, the concept of 'national reputation' or 'international influence' may be more or less relevant than in others. Architects that pursue enquiry by design, for example, tend to build regionally rather than internationally, so their influence is closer to home. If a group can collectively agree on some standards, they will help each other and be better equipped to make those arguments at the divisional level.

b) Who's up next?

Think about a nominal schedule of applications to Full. This is by no means a case of everyone taking their turn to be automatically approved by their friends—such applications will not pass muster at the Divisional level—but a collegial way to enable faculty to come forward for a fair, objective review in an orderly, routine way. Some may feel they are not ready and decline from going on the schedule. Others may wish to be considered sooner, maybe within five years from tenure and ask to go on the list as soon as possible. Some may be encouraged by their position on the list and start working harder toward their target date (possibly 2-3 years hence). In any event, it establishes a positive, constructive approach to promotion by getting the issues on the table well ahead of time and creating a culture of encouragement rather than solely judgement.

2. Get a Plan

If you want to go for Full (with or without a departmental plan), don't keep it to yourself. Let your colleagues know you're coming a good, long time in advance so there are no surprises. Announce it at an annual or post tenure review as you outline your future plans. Don't be confrontational but seek support and give your colleagues updates on your progress regularly. When you eventually come up for review, the concept of your promotional consideration will be no surprise, will have been well discussed and will

hopefully be just business as usual—if there were any problems, they could have been resolved in the previous couple of years, so that the review can focus squarely on the merits of your case.

3. Get Advice

Buy your colleagues into your case. Ask their advice on your strategy for promotion, on the substance of your work, on your progress and offer the same advice to them if they want it. Creating an internal network of colleagues is helpful scholastically, but also creates a vital network of ultimate supporters who, if they believe you have met the criteria, can effectively argue your case at the Executive Committee level. Don't go it alone.

4. Get a Network

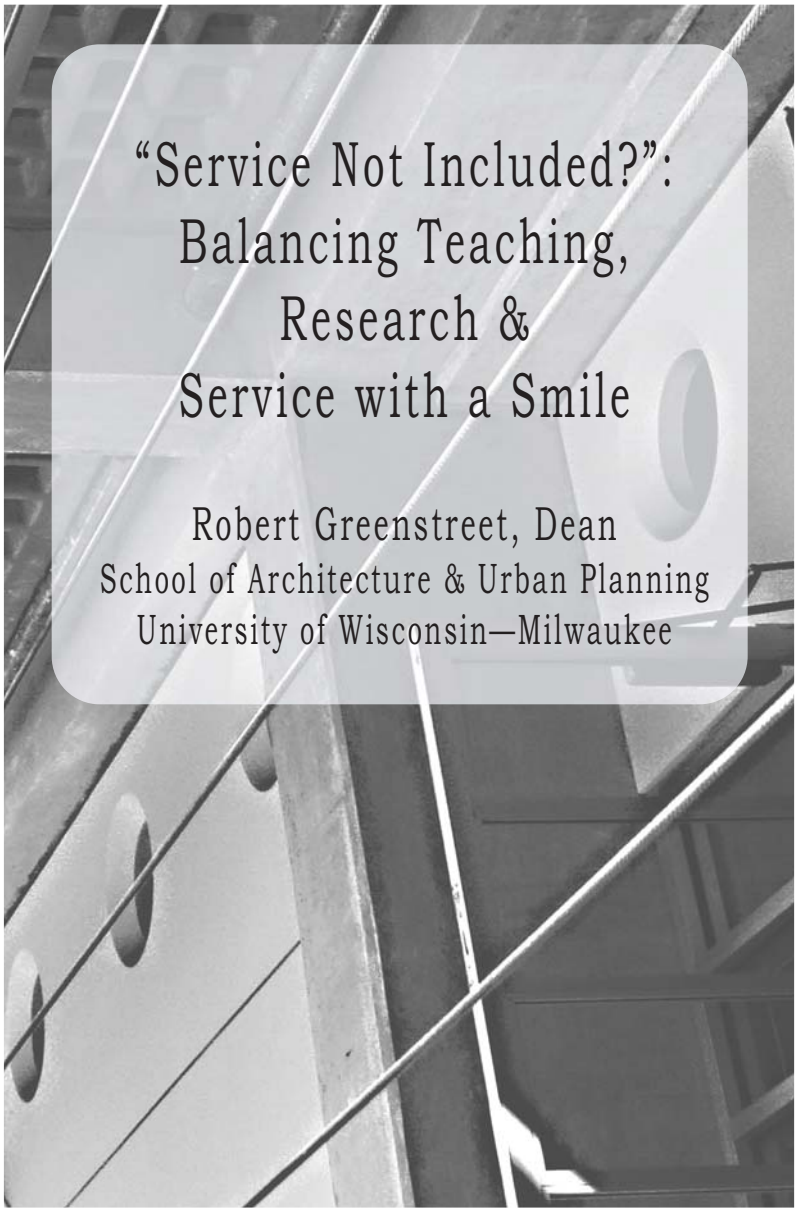
How do you build that golden reputation that spans the globe? Well, a Nobel Prize helps but, for us lesser mortals, knowing folks is where it starts. As part of your promotion plan, involve as many influential characters as possible. Ask technical advice from Divisional Committee members (past and present), your chair and dean, but make sure you interact with as may peers outside the institution as possible in the years leading up to review. Go to conferences, write to people, e-mail them—ask their advice, send them your stuff. How do you think that national/international reputation is established? Through the opinions of your peers, and their letters of support. This group can also be invaluable in helping you develop your academic profile, inviting you to give papers at conferences, partnering in research projects or identifying opportunities that you may not have heard about.

5. Get a Case

Just like tenure, you need a clearly argued 'legal' brief to accompany your materials. Start writing this way ahead of time, when some of the details may still be unfinished, still in flux or just not begun. The brief, your story if you like, becomes the narrative that argues your Professorial merit and, if done well and regularly updated to encompass new achievements and opportunities, becomes a lucid route map to promotion. It's also a useful document to use in discussions with your rapidly burgeoning network of colleagues and supporters.

Getting Full is not an automatic right. It merits a high standard of academic quality and not everyone is going to meet those standards. However, the process should be solely about academic merit, not misperceptions of the standards, interpersonal rivalries or psychological pressures. The first place to start dispelling these interfering factors is through communication—raise these issues with your colleagues, start discussions on difficult issues, like criteria, and work towards a collective process on moving through the academic ranks, if you don't have one. It may not always be a smooth path, but talking it through, long in advance of any decisions, is always going to be an ultimately better course.

Appendix B



"Service Not Included?": Balancing Teaching, Research & Service with a Smile

Robert Greenstreet, Dean
School of Architecture & Urban Planning
University of Wisconsin–Milwaukee

They're always the first two questions new faculty ask—how do I juggle my teaching, scholarship and service obligations, and how much should I do of each? Replies will vary widely depending upon who you ask, which, of course, only confuses the issue further. Having been told by a senior colleague to do as little service as possible, it may not exactly square with the rather more insistent request from your chairperson to do your turn on the admissions committee. Baffling, isn't it? Here then is another opinion on the role of service in the faculty workload. It does not necessarily coincide with the views of my colleagues, peers or indeed any other sentient life forms, and it may or may not be appropriate in your discipline, in your department or in your school. The important thing is to find out from those whose opinions matter—as your colleagues, chair or dean about service as a part of your personal faculty development in the early years of the tenure-track. Give them a copy of this article—see if they change color. Tell them what you would like to do, find out what they really expect you to do and discuss any differences. It may not be what you want to hear, but at least the dialogue is opened on the topic which is most important to you—your professional development (of which service is an integral component).

Is service really important?

Well, it's mentioned in your contract right there with research at 25% of your overall workload, but isn't research and scholarly activity more important in getting tenure? Yes, of course. So shouldn't you blow off service and concentrate on publishing? No. It's not a question of choice, but a question of balance, and service is important. It is necessary at both departmental and university levels to ensure that shared governance, the backbone of our system, functions properly. It is important in fulfilling the urban mission of the university in our outreach efforts to the city and state, and it is also instrumental in carrying the reputation of your own program beyond the boundaries of the campus into the national and international arenas.

Hang on, I thought service meant sitting on a few committees.

Not necessarily; service may be defined in a number of ways. There will inevitably be committees within your department that need staffing, but there may be other opportunities to be appointed or elected to task forces, committees or councils at the school/college or university level as well. Service to the community could take the form of serving on commissions, task forces, etc., for neighborhoods, governmental bodies or companies that have sought the expertise of the university. Sometimes, the service obligation may be limited to providing input at a series of meetings, or sometimes it may be task specific, such as in the provision of design ideas or a feasibility study for a proposed project.

Service may also be possible within a broader, field, working with local, regional or national organizations that represent faculty within a specific discipline or with professional groups, such as nurses or engineers.

All of these activities constitute service, and all have value of varying degrees depending upon your specific contribution, but also upon the value placed upon it by your colleagues—make sure you find out their collective opinions before you commit yourself to an extensive tour of duty.

But is it useful?

Sure—you get to impress your departmental colleagues (who will be the first judges of your performance at merit time, contract renewal and tenure) with your devotion and value to the program. You get to meet other faculty around the university, important folks in town, key players in your professional field. This spreads your reputation as well as that of the university and may possibly lead to secondary opportunities—joint research projects, speaking engagements, consulting work—all sorts of things.

Okay, I'll do it. But how much should I do?

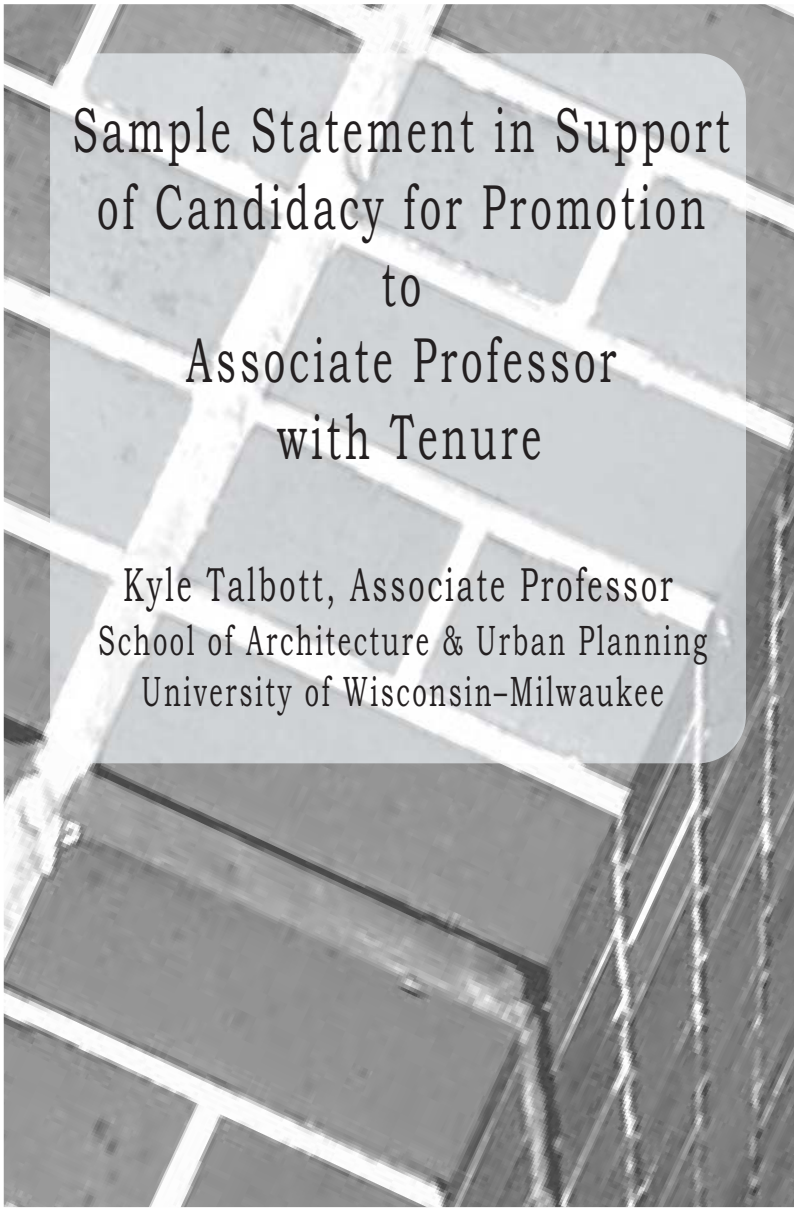
Remember, volunteerism lasts a lifetime—don't try to do the lot in your first two years, or you'll just burn out. If you have to prioritize, make sure you do your bit in the department—be a good colleague, take your fair share of the committee work, and prove yourself an invaluable member of the team for the obvious reasons of collegiality and, of course, survival. A modest presence at the university level is good too—you get to work with colleagues you would normally never meet and also develop a broader perspective on the university and its system of governance. Service to the community and professions is both rewarding and useful so, if you're inclined, do the stuff you really like doing and at which you excel. If the work feeds into a research or teaching agenda, all the better (see *The Junior Faculty Handbook* for more details on 'piggybacking').

Choose your assignments carefully. In some instances, it may be difficult (i.e., professional suicide) to decline an assignment. If so, accept gracefully. I would be happy to share with you my own experiences in this regard serving on the Contagious Diseases Committee some years ago, now that Prozac is readily available. Where you are reluctant to serve due to time pressure or preference, use the request as an opportunity to discuss your broader goals, explaining what you'd like to do and over what time span. Rather than a refusal (I'm too busy!) which is guaranteed to irritate, expand the context of the discussion to your overall career plan. Show initiative in laying out what you feel is the best use of your service time. If the department doesn't agree, at least you are aware of the difference of opinion and hopefully a constructive dialogue can begin. Better to do this now than in your fifth year.

If you have the luxury of choice, choose carefully and wisely. Don't select committees that rarely meet just to technically meet the service obligation—we all see right through that one—and similarly avoid committees or assignments that are open-ended and will endlessly suck up your time. Look for ones with clearly defined tasks and outcomes, specified numbers of meetings and a fixed timeline so you can budget your time accordingly.

Getting the balance between the teaching, research and service obligations is never easy and there is a tendency to minimize the latter out of economy of time and more immediate pressures presented by our scholarly growth and classroom demands. Looked at constructively, however, a service component that is carefully planned with full colleague support can be rewarding personally and of great benefit to the department and university. Just chose your roles wisely and focus your skills and time appropriately over time. By the way, is anyone interested in taking my place on the Contagious Diseases Committee?

Appendix C



Sample Statement in Support of Candidacy for Promotion to Associate Professor with Tenure

Kyle Talbott, Associate Professor
School of Architecture & Urban Planning
University of Wisconsin–Milwaukee

Kyle William Talbott
Documents in Support of Promotion to Associate Professor with Tenure
University of Wisconsin – Milwaukee School of Architecture and Urban Planning

Statement in Support of Candidacy for Promotion to Associate Professor with Tenure

INTRODUCTION

My field of inquiry is Computer-Aided Architectural Design (CAAD). CAAD research studies architects' use of graphical software to simulate and test proposed works of architecture. Because the simulation capabilities of CAAD software exceed traditional drawing and model-building media, CAAD software supports new methods of architectural design, which architects and software developers are only beginning to understand.

Architects have relied on drawings and models to conceive their designs since the Renaissance. These tools reigned for centuries until the invention of CAAD software about forty years ago, and CAAD software is now an integral part of architectural practice. Despite wide-spread adoption, architects' have generally resisted this change. They continue a conservative use of traditional media, they curtail the role of software, and they cling to early forms of software, which do little more than mimic traditional drawing and model-building. Few architects embrace the newer generation of CAAD software, which has grown substantially in power and scope over the past decade. Emerging software allows architects to visualize and modify three-dimensional environments with unprecedented speed and precision. With this ability, architects test more ideas in less time, and test them more thoroughly before construction begins in the field. Emerging software gives architects parametric control of complex geometry, which supports new modes of form-finding and new sculptural products. Emerging software allows architects to build massive databases of technical information, which facilitate interdisciplinary collaboration and robotic fabrication. With expert system programming, it even participates in the creative work, more like a collaborator than a tool. CAAD software now offers more than a replication of traditional media; it fundamentally changes design methods employed by architects since the 14th century. Confronted with this upheaval, architects struggle to assimilate CAAD software and manage its consequences on their creative work. My research contributes to a growing effort to dissect these new capabilities, identify potential pitfalls and opportunities, and reveal a viable path of progression for digital practice.

Starting in 1995 I conducted CAAD research for NBBJ Inc., the fifth largest architecture firm in the world[1]. As a member of NBBJ's Process Redesign Group[2], my research defined the firm's strategic response to technological change[3], and in 1997 the Partners appointed me CAAD Process Developer for the Eastern United States Division of the company[4]. In this role, my research developed and field-tested CAAD software and associated design methods in collaboration with architectural project teams[5]. It also defined a theoretical framework to guide this effort[6]. After my promotion into the NBBJ Management Group in 1998[7], my responsibilities expanded to include 1) strategic advising to firm Partners regarding CAAD research initiatives[8],

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[2] [5.5.1]
[3] [3.6.17]
[4] [2.3.4]
[5] [3.6.10] [3.6.31] [3.10.1] [3.16.1 – 3.16.11] [3.22.5]
[6] [3.6.2] [3.6.17] [3.6.21]
[7] [2.3.5]
[8] [3.6.5 – 3.6.7] [3.6.12] [3.6.13] [3.6.19] [3.6.24] [3.6.27] [3.6.29] [3.6.33] [3.22.2 – 3.22.4]

2), teaching innovative CAAD methods to professionals[9], and 3) collaborating with the second largest international producer of commercial CAAD software to develop an innovative software product[10].

Although NBBJ provided a fruitful setting for CAAD research, its proprietary nature limited dissemination of results and collaboration with outside architects. These constraints felt tighter as my attention turned to problems facing the entire profession. Many architects struggle to adopt CAAD software because their patterns of creative thinking conflict with procedures codified in software. Although the drawings, models and other visual products offered by software are valuable, architects endure a litany of artificial distractions and obstructions in order to produce them. Seeking to expand my investigation of these problems of human-computer interaction, and to join a wider community of researchers, I came to the University of Wisconsin - Milwaukee in 2001.

Due in part to the rudimentary nature of early computer technology, CAAD researchers traditionally de-prioritized the study of human-computer interaction in order to address algorithm design and computational efficiency. This work was conducted predominately by those with an expertise in computer science, not architecture. However, now that robust software is widely available, the scope of CAAD research has expanded to more carefully address the impact of software on architects. This is part of a larger movement to design better modes of human-computer interaction, which can be seen in fields such as Activity Theory, Computer Supported Cooperative Work, Computer-Aided Surgery, and Decision Support Systems. As part of this movement, my research tempers a traditional concern for the mechanics of CAAD software with a concern for the quality of architects' interaction with it. My research defines alternatives to established methods of interaction through architectural design experiments conducted collaboratively with architects in the field and with students in the laboratory. The research has been published in leading international journals[11] and presented at international conferences[12]. It is facilitated by the School's Rapid Prototyping Laboratory, which was planned and implemented under my direction[13]. The research also provides content for a book on CAAD methods, which is currently in progress under contract with a leading international publisher in the field[14].

As CAAD methods displace traditional design methods, schools of architecture confront a new concept of mastery. Mastery is no longer judged by one's knowledge of a static, centuries-old orthodoxy. Instead, it is judged by the breadth of one's methodological repertoire, and by the speed at which one assimilates new methods. Embracing this change, my teaching prepares students for both the present and future of architectural practice. The current reality of practice requires knowledge of diverse visual media, popular CAAD methods, and a still influential orthodoxy. My teaching provides this knowledge, but also introduces emerging CAAD methods. Students learn that the answer to any question of "how" depends on a context of technological capabilities. By studying how architecture was designed in the past, how it is designed today, and how it will be designed in the near future, the concept of a static orthodoxy dissolves. My teaching presents the current state of practice as a launching point from which students will lead disciplinary change, and it stresses the role of CAAD technology as a driver of progress.

[9] [3.6.8] [3.6.9] [3.6.16] [3.6.18] [3.6.20] [3.6.22] [3.6.25] [3.6.26] [3.6.28] [4.B.2.1] [4.C.3]
[10] [3.3.2] [3.8.5 – 3.8.19] [3.8.21 – 3.8.32] [5.4.1]
[11] [3.3.5] [3.3.11] [3.3.12]
[12] [3.3.1 – 3.3.4] [3.3.6]
[13] [3.22.6]
[14] [3.4.3]

CAAD technology requires schools of architecture to adopt an arsenal of new tools, as well as a curriculum that brings them to life. My role in the School of Architecture involves leadership in its major computer technology initiatives, including the e3 Program – an innovative student laptop program[15] – and renovation of the School's computer curriculum[16] to include the first required CAAD course[17], a new advanced CAAD course[18], and CAAD integration with design studios[19]. After completing this massive improvement effort in less than five years, the School of Architecture exceeds national standards of CAAD education[20] and secures a foundation for future innovation. My leadership is now expanding to the national and international CAAD research community. As a junior member of the Steering Committee[21] of the Association for Computer-Aided Design in Architecture, my views influence the preeminent academic association for CAAD research in North America[22]. Additionally, my position on the editorial board of the International Journal of Architectural Computing[23] grants me influence on a leading vehicle for disseminating CAAD research internationally.

My special concern for the quality of architects' interaction with software grows from my diverse background as a practitioner exploring new CAAD methods and as a software developer championing the needs of architects. Building an intellectual agenda on this foundation, my research, teaching and service are uniquely positioned to strengthen a humanistic perspective in the field of CAAD research, and to promote the rise of a new paradigm of architectural practice in the Digital Age.

RESEARCH

With CAAD software architects' traditional repertoire of visual media expands to include interactive computer simulation. A computer simulation can be a simple diagram or a comprehensive volumetric depiction of a proposed future state (Figure 1). A computer simulation is often called a "virtual model" to distinguish it from a traditional "material model" of wood, paper or clay. Using virtual models, my research develops modes of architect-computer interaction in three areas. The first, *Building Information Modeling (BIM)*, uses a virtual model to produce and coordinate the extensive technical information needed in architectural design. The second, *Rapid Prototyping*, uses a virtual model to guide the automatic fabrication of an equivalent material model. The third, *Generative Modeling,* uses an expert system to create portions of a virtual model automatically, working with architects as a decision-making agent. These topics reflect widely accepted categories of CAAD research. While they are isolated for study, they are interrelated aspects of a new paradigm of architectural practice. Each leverages a unique potential of computer simulation to expand the reach of architectural innovation.

[15] [5.2.5]
[16] [4.B.2.3] [4.B.4.3]
[17] [4.A.3.3]
[18] [4.A.3.7]
[19] [4.A.3.5] [4.A.3.1]
[20] [5.6.3]
[21] [5.4.4]
[22] [5.4.3]
[23] [5.4.5]

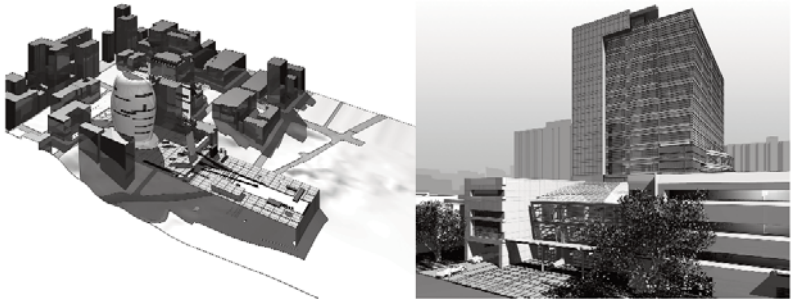

Figure 1: Left: Computer simulation of a proposed hospital in Seattle, Washington by NBBJ Inc.[24]. Right: Computer simulation of a proposed office tower in Columbus, Ohio by NBBJ Inc.[25].

In each area, my research matures in pace with supporting technology and its assimilation into professional practice. My BIM research is the most mature. It follows a ten year arc from the development of early theories and prototypes, through testing and refinement in experimental practice, and finally to broad dissemination of robust methods. My Rapid Prototyping research, in contrast, develops CAAD methods in experimental practice, preparing for architects' mainstream adoption of the technology. Operating further upstream, my Generative Modeling research contributes a competing theory and prototype. This balance of mature and formative research follows the larger rhythm of research in the field, and it expresses my evolving engagement with a rapidly advancing subject matter.

Area 1: *Building Information Modeling (BIM) Research*

In past centuries architects predominately depicted designs using flat drawings (Figure 2), despite the tendency of drawings to impede spatial understanding. CAAD software overcomes this limitation with virtual model-building systems, which provide a dynamic three-dimensional depiction of architecture. Instead of deciphering a spatial meaning from drawings, BIM starts with the spatial depiction and uses an expert system to automatically generate drawings from it (Figure 3). Once central to architectural expertise, the skill of drawing is curtailed by a fundamentally different skill: constructing and managing virtual models. In order to prepare for this change, some forward-looking architecture firms began exploring BIM in the early 1990s.

My research in this area began at the international architecture firm NBBJ Inc.[26] with the development of information management techniques distributed to NBBJ architects in a guidebook called Process Innovation for CAD[27], and through an associated software product called CDLink[28]. The software combined elements of drawing and BIM. Using CDLink, traditionally disjointed drawings became tightly coordinated through automated cross-references

[24] [3.6.32] [3.13.18]
[25] [3.16.7] [3.16.9] [3.18.11]
[26] [2.3.3. – 2.3.5]
[27] [3.4.1]
[28] [3.8.3]

and updates, which were managed through a central database. The software was used to produce construction drawings and specification documents for five building projects totaling $62 million in construction cost[29]. CDLink and other experimental software[30] were developed in a collaborative environment that emphasized dialogue with architects, field testing and incremental revisions.

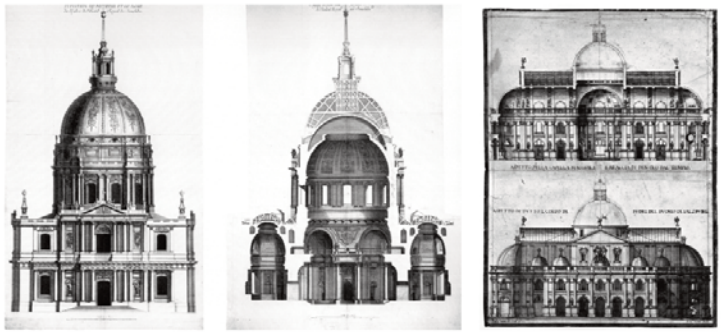

Figure 2: Traditional method: architecture derived from a collection of discrete drawings[31].

The success of CDLink and related work led to my recognition with a firm award for "…outstanding performance and for your contribution to the firm and our industry"[32]. Additionally, the work ignited a rapid expansion of BIM research at NBBJ from 1997 to 2001. My research shifted in emphasis during this time from the development of software to the development of design methods needed to leverage BIM software. Working directly with architectural project teams, my research involved the development and testing of CAAD methods[33] on eleven building projects with a total construction cost exceeding $275 million[34]. These large-scale projects include two full-service hospitals[35], a corporate office tower[36], and the first major league soccer stadium constructed in the United States[37]. The research included the development of quantitative measures used to analyze and track the success of experiments[38]. Proprietary CAAD methods resulting from this research were disseminated to NBBJ offices nationwide[39] and

[29] [3.18.1 – 3.18.5]
[30] [3.8.1] [3.8.2]
[31] Left: Elevation and section of Eglise des Invalides, 1646. Right: Elevation and section of a design for Salzburg Cathedral, 1607. Eve Blau and Edward Kaufam (eds), Architecture and its Image: Four Centuries of Architectural Representation, Cambridge: MIT Press, 1989.
[32] [3.21.14]
[33] [3.22.5]
[34] [3.18.6 – 3.18.16]
[35] [3.18.6] [3.18.12]
[36] [3.18.11]
[37] [3.18.7]
[38] [3.6.12] [3.6.19] [3.6.24] [3.6.29] [3.10.1] [3.16.4] [3.16.10]
[39] [3.6.2] [3.6.8 – 3.6.11] [3.6.16] [3.6.17] [3.6.21] [3.6.22] [3.6.25] [3.6.31] [3.13.1] [3.13.3 – 3.13.9] [3.13.13 – 3.13.15] [3.13.18] [3.13.19] [3.16.3] [3.16.5 – 3.16.9]

later disseminated to the profession at national and international conferences[40]. The research contributes to NBBJ's reputation for leadership in this area, reflected in international awards for BIM excellence. Additionally, NBBJ is a role-model and adviser to architects at leading international firms and related businesses, who are beginning to explore BIM[41]. Architect Taylor Hamblett, a member of the NBBJ Management Group, describes the lasting influence of my research: "To this day the tools and techniques that Kyle helped to develop for NBBJ continue to grow as a central part of NBBJ's culture thanks in large part to the foundation laid down by Kyle and his team"[42].

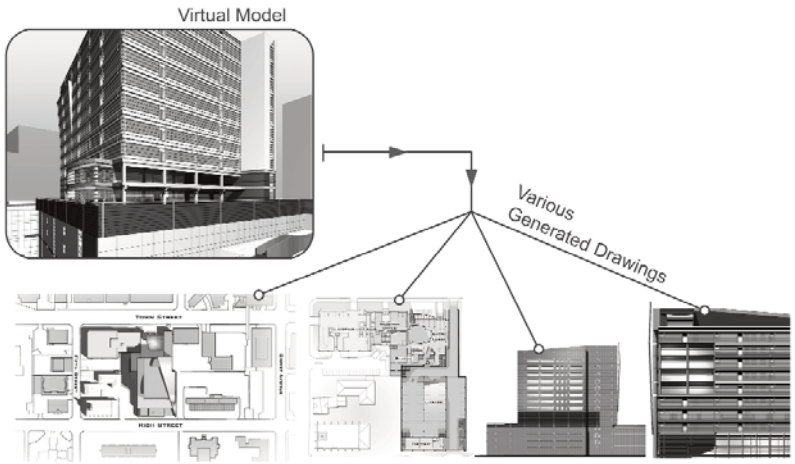

Figure 3: BIM method: discrete drawings derived from virtual architecture. Project shown: Office Tower in Columbus, Ohio by NBBJ Inc.[43].

Although primarily concerned with CAAD methods, my research continued to involve associated software development, which defined more fluid and subtle modes of interaction between architects and BIM software. Some of this research included: 1) development of a comprehensive BIM software interface for architectural designers[44], 2) a method for distributing Best Practices to architects through a BIM database[45], and 3) a database of cost estimating parametrics linked to a BIM model and used for rapid cost feedback[46]. In addition, my research influenced software development outside the proprietary environment of NBBJ through a

[40] [3.13.2] [3.13.10] [3.13.11] [3.13.12] [3.13.16] [3.13.17]
[41] [5.7.2]
[42] [3.21.16]
[43] [3.16.7] [3.16.9] [3.18.11]
[44] [3.8.20]
[45] [3.8.4]
[46] [3.16.9]

continuing eleven year advisory relationship with Bentley Systems Inc., the world's second largest producer of commercial CAAD software[47]. As a founding member of Bentley System's Architecture User Council[48], I represented NBBJ in an invited group of six to eight advisors, each from a leading international architecture firm. In this role my research helped Bentley Systems set strategic goals for its first BIM software, called MicroStation/TriForma, during its formative years of development[49], and provided detailed feedback to the software development team based on extensive field trials of the software[50]. In discussions with software developers, my feedback emphasized the need for a wider set of principles to guide decisions related to architect-computer interaction[51]. This focus on interaction included my co-development of a method of usability testing called a Design Process Benchmark, which communicates subtle details about architects' software needs and encourages empathy for those needs among software developers[52]. Bentley Systems recognized my contribution to the development of MicroStation/TriForma with an award[53], and the software is now one of the leading commercial BIM products, licensed internationally to over 300,000 architects and engineers in the building industry[54].

As BIM enters mainstream practice, architects need clear descriptions of proven methods. A UWM Graduate School Grant[55] supported the development of a system of visual notation for documenting these methods, and this system is now being used in the first detailed visual description of BIM model-building methods in a book length publication. Entitled Mock Up: Architectural Design with Computer Models[56], it is in production under contract with *Elsevier Architectural Press*, a leading international publisher in the field. A blind, external reviewer concluded, "The proposal is exciting and very different from related books on the market." The manuscript is scheduled for completion in December 2007. Containing approximately 1,500 step-by-step illustrations of virtual models and an extensive system of cross-referencing, the production of the book itself entails an experimental use of BIM methods.

Area 2: *Rapid Prototyping Research*

Rapid Prototyping automatically converts a virtual model into an equivalent material prototype. Rapid Prototyping takes many forms, but one common approach is 3D printing, which works much like a conventional inkjet printer. Instead of printing on a flat sheet of paper, however, it prints a solid volume using powder, wax or plastic. Figure 4 shows 3D prints combined with wood components to depict conceptual designs for a screen wall. In the left image, the ball joints are 3D prints. In the middle images, the white frames are 3D prints. The images at right show a set of 3D printed components (lower) and the virtual model used to drive the printer (upper). Rapid Prototyping reduces the time needed to produce a material prototype, while increasing the range of achievable forms. Whereas BIM uses a virtual model to surpass traditional drawing, Rapid Prototyping uses a virtual model to surpass traditional model-building.

[47] [3.2.2]
[48] [5.4.1]
[49] [3.8.9] [3.8.10] [3.8.13] [3.8.21] [3.8.24]
[50] [3.8.5] [3.8.6] [3.8.8] [3.8.11] [3.8.12] [3.8.14 – 3.8.18] [3.8.23] [3.8.25 – 3.8.28] [3.8.31] [3.8.32]
[51] [3.8.7] [3.8.22] [3.8.29]
[52] [3.8.30]
[53] [3.21.15]
[54] [5.4.1.1] [5.4.1.2]
[55] [3.11.1]
[56] [3.4.3]

Figure 4: Material models composed of 3D printed components and wood components[57].

My Rapid Prototyping research develops CAAD methods for concurrent use of virtual models and material prototypes, which contributes to an area of CAAD research called media interaction theory. By selectively combining traditional media and computer simulations, media interaction theory opens an additional window on the nature of architect-computer interaction. The research clarifies unique capabilities in each medium, as well as crucial underlying similarities, and it informs the development of CAAD methods better calibrated to the diverse and subtle needs of architects. Pioneering research in media interaction was conducted predominately in the mid-1990s, before the rise of Rapid Prototyping. My research strengthens the tie between media interaction theory and this newer technology[58]. The research has been published in the proceedings of national academic conferences[59] and in a leading international journal in the field[60]. Additionally, related designs were included in a national traveling exhibition[61] and related research was presented at a national conference[62].

Because Rapid Prototyping research requires specialized equipment, I led the two year planning and implementation of a Rapid Prototyping Laboratory (RP Lab) in the School of Architecture and Urban Planning[63]. Opened in October 2005[64], this is the first laboratory of its kind in the University of Wisconsin system and the first in the region to cater to the special needs of architects. Planned as a self-sustaining business, it employs a staff of six student research technicians and maintains a busy schedule of 40+ hours of operation weekly. In addition to supporting the research described above, the RP Lab provides research support to the architecture community in southeastern Wisconsin. The RP Lab established a service

[57] [3.3.8] [3.3.12]
[58] The media interaction perspective also influences my Generative Modeling research. See for example [3.3.5] and [3.3.11].
[59] [3.3.8] [3.17.12] [3.17.13]
[60] [3.3.12]
[61] [3.18.25] [3.18.26]
[62] [3.3.7]
[63] [3.22.6]
[64] [3.12.1]

relationship with eight architecture firms during its first year in operation, including four of Milwaukee's largest firms[65]. By collaborating with regional architects, the RP Lab strengthens ties between the School and the profession, influences design methods of regional architects, and equips them with technology needed for national competitiveness.

Area 3: *Generative Modeling Research*

Unlike conventional CAAD software, *Generative Modeling* software controls some portion of the creative work, generating new designs by means of an expert system. This changes the relationship between architect and tool, turning software into a collaborator. The central value of Generative Modeling is automated search through a vast number of possible designs, which speeds the solving of complex problems and reveals innovations that would otherwise be overlooked. Despite these values, architects have been reluctant to use Generative Modeling for fear of surrendering too much creative control to a computer. This fear might be warranted. Research conducted by pioneers in the field often allocated ample control to the software, allowing it to generate hundreds or thousands of possibilities independent of human oversight. This substantially curtailed architects' participation, putting them on the sidelines in order to showcase the generative power of software. Consequently, architects have often been frustrated by Generative Modeling, and no software has yet entered mainstream practice. My research offers an alternative set of principles for Generative Modeling that respect architects' need to lead the creative effort and express a cohesive creative vision while still reaping the benefits of expert system support.

My research starts from the premise that computers can easily generate enough information to surpass the ability of architects to comprehend and use it. Therefore, the challenge of Generative Modeling is two-fold. In addition to generating innovative designs, software must present this information in a way that enables architects to assimilate and use it. Although software engineers have made progress in the former task, they have not adequately addressed the later. My research helps fill this gap by defining principles for Generative Modeling methods that respect the cognitive limits of architects. A detailed analysis of cognitive limits was the subject of a paper published in a leading international journal[66]. Related principles were discussed in a national conference paper[67] and related experimental results were presented at an international conference[68]. Based on this analysis, a software prototype was defined, which supports and demonstrates an alternative Generative Modeling method. This research was presented at the leading international conference[69], and published in a leading international journal[70]. Having laid a theoretical foundation and produced a preliminary software prototype, a proposal for extramural funding will be pursued for further software development and empirical testing.

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In the areas of BIM, Rapid Prototyping and Generative Modeling my research helps architects realize the creative potential of interactive computer simulations by defining design methods appropriate to this powerful medium. My research tempers the reductive logic of conventional software development with a concern for the creative needs of architects and the complex reality

[65] [3.22.6.6 – 3.22.6.13]
[66] [3.3.5]
[67] [3.3.4]
[68] [3.3.2] [3.3.3]
[69] [3.3.6]
[70] [3.3.11]

of architectural practice. By defining a sound CAAD methodology to accompany technical innovations, the research helps architects adapt traditional design methods in appropriate ways, assimilate new methods more readily, and benefit from CAAD software without becoming alienated. My research also helps software developers anticipate architects' needs, which inform the development of more humane CAAD software. In these ways my research supports a new paradigm of architectural practice based on the capabilities of emerging CAAD technology.

TEACHING

My teaching provides the School of Architecture and Urban Planning with a core CAAD curriculum, as well as an advanced curriculum in the areas of Building Information Modeling (BIM), Rapid Prototyping and Generative Modeling. Through my leadership in this area, the School's CAAD curriculum was rebuilt and strengthened[71] to compete with architecture programs nationally. At the conclusion of a comprehensive review of the School in 2004 by the National Architectural Accrediting Board, the reviewers stated: "The use of computers and associated technologies deserves high recognition."[72] My contribution was recognized through peer review with an award for teaching in 2001, 2002, 2003 and 2005[73]. Because CAAD software is an essential tool of architectural practice, my teaching provides foundation knowledge required for students' entry-level employment, as well as knowledge needed for future leadership.

Whereas new graduates traditionally acted as apprentices in their early years of practice, expectations are now higher. New graduates and veteran practitioners have a learning partnership, through which each acquires valuable knowledge. New graduates benefit from the practical wisdom of veterans while veterans benefit from the CAAD prowess of new graduates. To provide the leadership expected of them, students need a substantial body of experience in the strategic application of CAAD methods. Understanding principles is not sufficient; they must translate principles into action. The studio setting facilitates this kind of learning. Similar to a laboratory, studio is a testing ground where the implications of emerging CAAD methods are explored hands-on, and free from the imperatives of commercial practice. This helps students acquire valuable expertise and simultaneously shields professionals from some of the financial risk of such testing.

The academic studio facilitates my research. Just as my research with NBBJ happened in collaboration with architects designing real buildings, my research now happens in collaboration with student architects, who design hypothetical buildings based on real-world conditions. The results of studio experiments are compared to typical results seen in conventional practice, and to experimental results in related fields such as psychology and creativity theory. Based in a tradition of design rather than science, the primary purpose of my studio-based research is to identify new modes of architect-computer interaction and demonstrate their creative potential. Rather than seek quantitative proof of the superiority of one mode over another, the research undertakes a qualitative study of interaction in order to expand architects' repertoire. Since students also seek to expand their CAAD repertoire, a fruitful symbiosis of teaching and research occurs naturally. Students make ideal research partners not only because they are eager to explore the tools, but because they are untainted by the biases of conventional practice.

[71] [4.B.2.3] [4.B.4.3]
[72] [5.6.3]
[73] [4.A.5.4 – 4.A.5.7]

My lectures and seminars supplement studio teaching with an examination of underlying concepts and theories. Students learn about the structure and history of CAAD software. They study the nature of computer simulation, its limits, and how computer graphics impact visual composition. Importantly, students learn how CAAD software affects creativity, sometimes sparking insight and sometimes obstructing it. Armed with relevant principles, students navigate a complex technological landscape and engage hands-on exploration with a higher purpose.

Innovations in Teaching

1. Arch 281/781: Virtual Modeling

This new course provides a core CAAD curriculum for the School of Architecture[74]. As the first required computer course in the history of the School, it accommodates the entire sophomore class as well as the incoming class of career-change graduate students for a total Fall semester enrollment of approximately 170 students[75]. The course teaches foundation knowledge in virtual model-building, Building Information Modeling (BIM), light and material simulation, computer-aided drawing, information management and visual composition.

The course uses an innovative teaching approach based on principles of inductive reasoning[76]. The approach mitigates the potentially alienating effects of CAAD software by introducing more tangible modes of interaction first, and gradually moving to more abstract modes. As part of the approach, model-building is introduced as the foundation skill. This contrasts traditional CAAD instruction, where orthographic drawing comes first. Once students are proficient in model-building, the Virtual Modeling course shows them how to extract drawings and other imagery from the model using an expert system. In this way, it teaches fundamentals of BIM, which prepares students for advanced courses[77]. Unlike a typical introductory CAAD course, Virtual Modeling directly incorporates design studio coursework[78]. By combining virtual model-building and designing, students learn to use CAAD software as a creative tool from the beginning of their design education. This large-scale course integration effort involves four studio instructors and was refined over three years. Insights from the experience were presented at a national conference on course integration[79]. Another distinctive feature of the Virtual Modeling course is its devotion to hands-on learning. At such a high student-teacher ratio (170-1), the course would normally be delivered in a lecture format, which provides little opportunity for interactive learning. While the course does have a strong lecture component, it also incorporates approximately 30 hours of instructor-led, hands-on tutorials. Additionally, student coursework consists of weekly exercises that require production of professional quality virtual models, drawings and imagery. Examples of student work and associated teaching methods were presented at two regional conferences[80].

[74] [4.A.3.3]
[75] [4.A.1]
[76] [3.3.4]
[77] [4.A.3.5] [4.A.3.7]
[78] [4.A.3.1]
[79] [3.3.10]
[80] [3.13.20] [3.13.28]

2. Arch 810: Architectural Design I

This existing required course is the first design studio in the career-change graduate program[81]. Career-change graduates enter the Master of Architecture program after receiving a Bachelor degree in a non-architectural field of study. These diverse and ambitious students participate in an accelerated program, which distills the usual six years of architectural education to three and one-half years. Architectural Design I introduces design methods related to spatial composition, structural systems, materials, site responsiveness, human habitation and visual media.

Under my direction from 2002 to 2004, Architectural Design I was redeveloped to incorporate CAAD methods. This effort included integration with the Virtual Modeling course described above[82], as well as the study of hybrid media techniques, which combine hand drawing and computer simulation. Architectural Design I encourages students to adopt a critical attitude toward CAAD methods. Rather than assuming the superiority of a computer over the hand, students learn to discriminate positive and negative impacts. They participate in iterative exercises that compare hand drawing and computer rendering[83]. Resulting student design work was recognized with three awards for design excellence[84].

3. Arch 615/815: Advanced Topics in Technology and Theory: Microcosm

This new course is an advanced design studio for seniors and graduate students[85]. Its purpose is to deepen students' understanding of emerging CAAD methods. Students explore the potential of BIM, Rapid Prototyping and Generative Modeling to reveal innovative designs and transform architectural practice. Studying the theoretical roots of these tools as well as their application, students define core values and cultivate a strategic vision, which positions them to lead disciplinary progress after graduation. The Rapid Prototyping Laboratory[86] plays an important role in the studio, and students often subsequently become RP Lab Research Technicians working directly with regional architects. Work produced by my students was awarded for design excellence in 2004 and 2006[87], exhibited locally[88], and exhibited nationally[89].

4. Arch 390/790: Digital Design Practice

This new advanced CAAD lecture and tutorial course provides an in-depth study of Building Information Modeling (BIM)[90]. Because of its practice orientation, the course satisfies a Practice Elective requirement in the Master of Architecture program. Whereas the Virtual Modeling course[91] provides an introduction to BIM, the Digital Design Practice course provides advanced hands-on challenges and case studies. The course investigates three core aspects of BIM, including: 1) the construction and management of detailed virtual models, 2) the automated

[81] [4.A.3.1]
[82] [4.A.3.3]
[83] See [3.3.7] for a description of teaching methods and related research.
[84] [4.A.5.3]
[85] [4.A.3.5]
[86] [3.22.6]
[87] [4.A.5.3]
[88] [3.18.20] [3.18.23] [3.18.24]
[89] [3.18.25] [3.18.26] [3.18.27] [3.18.28]
[90] [4.A.3.7]
[91] [4.A.3.3]

extraction and management of drawings from a virtual model, and 3) the effect of BIM on team collaboration. Additionally, the course studies the relationship between BIM methods and digital fabrication methods. Regarding collaboration, the course uses innovative hands-on scenarios to mirror the circumstances of practice, and to show students how to coordinate design and documentation efforts with BIM software. These techniques are based on teaching methods developed for professional architects[92].

5. Object Based Design Project Team Education Program

Despite the effort of Schools to produce CAAD-proficient graduates, professional architects pursue extensive continuing education in CAAD methods. Working with two colleagues from 1998 to 2001, my teaching involved the conceptualization, development and delivery of an Object Based Design Project Team Education Program, a 48 hour continuing education curriculum in BIM-related CAAD methods[93]. The seminar and tutorial portion of the Program was delivered to 150 architects in short-duration problem-solving sessions[94]. The Program addressed architects' tendency to revert to old habits after completing a course of continuing education. With a three-stage approach, the Program guided professionals through goal-setting, hands-on tutorials, and finally, on-the-job coaching. This helped architects gradually absorb complex technical details and understand the connection between details and wider goals.

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My teaching facilitates the transmission of CAAD prowess from the academy into practice. Through systematic introduction and hands-on experimentation with emerging CAAD methods, my students master the principles and skills needed to push the boundaries of digital practice. The expertise they acquire in school positions them to lead disciplinary change in the Wisconsin architecture community and beyond.

SERVICE

Computer technology is increasingly mobile and distributed. As the era of the centralized computer laboratory declines, higher education responds with radical changes in its management of computer-related infrastructure. The School of Architecture and Urban Planning takes a leadership role in this change. Over the past five years the School has collaborated with Information & Media Technologies (I&MT) to develop and implement the University's first student laptop program, called the Electronic Education Environment Program (e3 Program)[95]. The e3 Program equips each architecture student with a dedicated laptop computer, as well as a suite of CAAD software, a wireless network, access to printing equipment, and comprehensive technical support. Through this ongoing experiment, we break new ground that benefits the entire campus. The experience gained by I&MT through the collaboration now informs its efforts with other campus units[96].

My service includes faculty leadership in the conception, planning, implementation and oversight of the e3 Program. Working with another member of the faculty, we coordinate the efforts of four campus units including Architecture, I&MT, The Bursar's Office and the Office of Student

[92] [4.B.4.1] [4.C.3]
[93] [4.B.4.1]
[94] [4.C.3]
[95] [5.2.5]
[96] [5.2.5.1]

Financial Aid. Within the School of Architecture, we coordinate involvement of the Faculty Executive Committee, the Bachelor of Science in Architecture (BSAS) Curriculum Committee, the Master of Architecture (MArch) Curriculum Committee, the Advising Office and the Information Technology Management staff in the School of Architecture. Each year we oversee the purchase, setup and distribution of over 400 computers[97]. In addition to my managerial role in this effort, my service includes leading a curricular response to the e3 Program. By inserting ubiquitous mobile computing into the School, the e3 Program changes students' expectations and their patterns of learning. As the Chairperson of the School's Technology Committee[98], it is my responsibility to forecast students' changing needs, advise the MArch and BSAS Committees regarding an appropriate curricular response, and define a CAAD curriculum that takes full advantage of the e3 Program.

My service extends beyond computer technology to include a role as co-editor of Calibrations: the Wisconsin Journal of Studio Architecture, volume 2[99]. This work involved the evaluation, layout and editing of over one hundred student design projects. By presenting a broad cross-section of student and faculty design work, Calibrations disseminates the School's values and pedagogy to an international audience including all accredited schools of architecture in North America, the largest national and international architecture firms, and one hundred of the most elite design firms.

My service to the national academic community grows from my membership in the Association for Computer-Aided Design in Architecture (ACADIA), the preeminent academic association for CAAD research in North America[100]. In my role as a junior member of the ACADIA Steering Committee[101], my service in the organization is expanding into leadership. Steering Committee membership is an elected office granted by a national vote of peer researchers. My leadership in the international CAAD research community grows from my position as one of eight North American editors for the International Journal of Architectural Computing[102]. As part of the Editorial Board, my responsibilities include defining issue themes, evaluating paper submissions, and managing the production of one issue per year. This elected position grants me significant influence over a leading vehicle for international dissemination in the field of CAAD research.

CONCLUSION

In the next phase of my academic career I will continue to explore the interaction of architects and computers, striving to reconcile the tacit, adaptive and subtle nature of creative architectural design with the explicit, procedural and universal nature of CAAD software. My research will continue to embrace the subtleties in this interaction, upholding these as key to humanizing the Universal Machine. My role as an integrator of complex architectural activities and tools will continue to strengthen the wider movement in our culture toward humane computer technology. It will also continue to strengthen an associated CAAD research literature that legitimizes the qualitative research methods of the designer as an important complement to the quantitative methods of the scientist. Through the critical analysis of existing CAAD methods and tools, and by proposing provocative alternatives, my research will continue to reveal new ways to augment

[97] [5.2.5.2]
[98] [5.1.7]
[99] [3.4.2]
[100] [5.4.3]
[101] [5.4.4]
[102] [3.1.12] [5.4.5]

architects' creative use of CAAD software. Because much work remains to be done in this area, and because issues of human-computer interaction will continue to gain importance, I look forward to a fruitful career building an internationally recognized expertise.