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The Tejido Group from Panama to Palestine

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# Apprenticeship Learning in Interdisciplinary and Multi-cultural Environments: The Tejido Group from Panama to Palestine

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*Abstract: For the past twenty years, the Tejido Group has developed into an interdisciplinary and collaborative applied research program in which faculty, students, and professionals in architecture, landscape architecture, planning, and business management collaborate in apprenticeship-style learning environments. Tejido is also an international and multicultural experience focused on a wide range of project types including: sustainable community development, urban and small town revitalization, urban waterfront design, and sustainable tourism projects in the United States, Latin America, and the Middle-East. Given the complex nature of the global political, socio-economic, and environmental contexts within which we work, our research and resultant design strategies necessarily need to consider a range of ordering systems as potential sources of design and planning form, i.e. economic, environmental, cultural, functional, and aesthetic measures of sustainability. This in turn, suggests that our teams become interdisciplinary and international in composition. Although cultural and political schisms are at times all too apparent in these multinational collaborative environments, we often find that cultural and professional commonalities emerge and become increasingly apparent to all participants involved. We also find that these experiences begin to catalyze better understanding of the potential influences and confines inherent in our design and planning professions regarding their ability to effect meaningful change in urban and small town fabrics. We seek to develop learning environments where mutual interests become increasingly apparent; where participants begin to realize that they are in the process of acquiring an array of global professional skills capable of effecting consequential change; and if we are fortunate enough, an environment where a shared sentiment begins to emerge that we are a part of something significant and enduring. This paper will introduce the purpose, process and products of the Tejido Group through review of recent international projects, including discussion of the often innovative and at times unpredictable, educational, and professional outcomes.*

*Keywords: Apprenticeship Learning, Studio Education, Global Practice, Design Process*

## INTRODUCTION

For the past twenty years the Tejido Group has developed into an interdisciplinary and collaborative applied research program in which faculty, students and professionals in Architecture, Landscape Architecture, Planning and Business Management collaborate in apprenticeship-style learning environments. Tejido is also an international and multicultural experience focused on a wide range of project types including: sustainable community development, urban and small town revitalization, urban waterfront design, coastal planning, campus master planning, and sustainable tourism development projects in the United States, Latin America and the Middle-East.





*Tree Festival in Birzeit*

Tejido has attempted to remain nimble in its ability to adjust and adapt to change within the profession, the projects and the student profile. This in turn, asks that we continually review our process, product, participant selection and training, and at times even suggests that we re-define our purpose. Our founding principles initially arose through affinity with the Bauhausian theory and the early writings of J. Dewey and later D. Schon, and have now migrated into study regarding design education and cognitive apprenticeship learning.<sup>1</sup>

The following introduces the purpose, process and products of the Tejido Group through review of recent projects in Panama and in Palestine, including discussion of the often innovative and at times unpredictable educational and professional outcomes.

### **Project Selection**

Tejido selects projects in which it wishes to participate based on several criteria: 1) project uniqueness and pedagogic value in developing our students into exceptional practicing professionals; 2) client need; 3) the project's potential impact on society and the environment. Although Tejido has and continues to develop projects through the construction document phase, we primarily focus on the generation of conceptual alternatives for our clients. We concentrate our efforts on developing innovative concepts through the application of research initiative.



*Mixed Use in Birzeit*

<sup>1</sup> Dewey J., *Experience and Education*, (New York, Free Press, 1997); Walter Gropius, "Bauhaus Manifesto and Program" (Weimar, Germany, The administration of the Staatliche Bauhaus in Weimar, 1919); Schon, Donald, *The Design Studio*, (London, RIBA Publications for RIBA Building Industry Trust, 1985); and *Educating the Reflective Practitioner*, (San Francisco, Jossey-Bass, 1987); Brandt, B.L., Farmer Jr., J.A., & Buckmaster, A. "Cognitive apprenticeship approach to helping adults learn", (*New Directions for Adult and Continuing Education*, 1993). 59, 69–78; McKeachie W.J., "Implications of Cognitive Psychology for College Teaching", In: *New Directions for Teaching and Learning*, Ed: W.J. McKeachie, (London, Jossey-Bass Publishers, 1980).

Unlike associations with traditional design and planning offices, Tejido offers clients an opportunity to afford in-depth applied research, and the subsequent generation of alternative concepts prior to design development and construction documents. In “real-world” situations, the conceptual design process is often foreshortened when financial resources are strictly limited. As we are essentially a non-profit organization dedicated to the education of our students and the needs of our clients, we can afford to focus our efforts on pre-design research and schematic exploration with our clients in developing complex, yet tailored master planning solutions. We see our relationship with practicing professionals as one of project creation and not of direct competition.



*Colonial Fabric of Avenida Central*

We render conceptual design and planning services that otherwise could not be afforded. Tejido assists clients in developing their ideas to the point where they are ready to seek the services of professionals in the design development and construction document phases. The master planning documents we develop become excellent tools for our clients in the solicitation of international, federal, state and private funding. Many past clients have been awarded substantial development grants, and these funds were then used to hire professional firms to execute the design and planning concepts outlined in our conceptual master planning documents. We collaborate with host country counterparts in our international projects in both project selection and in the programmatic development process. We also work in interdisciplinary and international teams when abroad as a means of ensuring project relevance as well as guaranteeing that all participants, including government agencies and NGO's, are committed collaborators. This of course, requires that all participants effectively communicate desired pedagogical and design outcomes for the studio. General sequencing and scheduling strategies are then discussed and developed, and alternative project programs and sites are examined. The host country participants most often take the lead in these tasks as they best understand what projects are most relevant to the needs of their communities. They are also better prepared to articulate central economic, environmental and social issues surrounding the projects.



*Design Team in Birzeit*

## Participant Selection

The globalization of our curriculum is a principal directive within Tejido and includes the development of our students into exceptional practitioners fully capable of working within a range of international fora.<sup>2</sup> As we often work in politically and economically complex multi-cultural scenarios, selection of potentially effective participants is essential. The call for student and faculty volunteers is in itself a useful pre-selection mechanism. When we ask for volunteers to work in the refugee camps of Palestine, only a select group of individuals usually steps forward. Our selection interviews reveal that most often these individuals are predisposed toward international work and that they are interested in developing a professional set of skills that enable them to function in distressed urban areas around the world. They are usually adventurous at heart, and want to develop a professional and personal relevancy in their ability to address global developmental issues. They usually understand that the globalization of the design and planning professions is requiring of them a new, flexible and comprehensive repertoire of design and planning responses to an array of complex urban development issues.

<sup>2</sup> Friedman T., *The World Is Flat. A Brief History of the Twenty-first Century*, (Farrar, Straus & Giroux, 2005); Schumacher E.F., *Small Is Beautiful: Economics As If People Mattered*, (Hartley & Marks, 1973); Cuff Dana, "The Origins of Excellent Buildings"; Adelson Marvin, "Observations on the Star Firms Research Roundtable", In: *In Search of Design Excellence*, Ed: Shibley R., (Washington D.C., AIA Press, 1989).



*Jerusalem*

### **Pre-immersion Process**

We have employed cultural immersion strategies from a number of international organizations including Peace Corps, UNESCO and the U.S. Department of State/USAID.<sup>3</sup> Prior to travel we immerse potential candidates in a series of orientation seminars that introduce them to key economic, political, environmental and cultural issues of the host country. Language and cultural training along with guest speakers and the viewing of relevant documentaries are quite effective in introducing participants to the realities of the task set before them. We also develop in-country immersion experiences for student volunteers prior to engaging in design activities. For instance, the Palestine project allowed our students several days residence in old city Jerusalem prior to traveling on to our housing and project site near Ramallah. This visit assisted our students in familiarizing themselves with the diverse cultural, political, linguistic and historical aspects of the region, thereby reducing the inevitable “culture shock” felt by most individuals in similar situations. The first early morning call to prayer from the Al-Aqsa mosque adjacent to our hostel created quite a revelation in our students, and the realization that, “we’re not in Kansas anymore” became vividly apparent. The streets, the architecture, the food, the music, the languages, the odors, the behaviors slowly began to integrate our daily realities.

<sup>3</sup> Peace Corps Center for Field Assistance and Applied Research, “The NGO Training Guide for Peace Corps Volunteers-community-based training”, (Information Collection and Exchange, publication # M0070, 2011); Singh K., *Rural Development: Principles, Policies and Management*–3rd Ed., (Sage Publications, 2009).

Our design and planning processes have been hybridized and developed through study of ideation and concept generation and development strategies developed within a number of exceptional design firms.<sup>4</sup>



*On Site in Gamboa*



*On Site in Nablus*

## Pre-design Process

Although Tejido advance teams visit project sites prior to project initiation, effective liaison with host country faculty, students and professionals is also essential during the pre-design phases of any project. Months prior to our arrival, host collaborators assist in project selection as well as preparation of demographic, cultural, environmental, economic, and site-specific information for us to digest during pre-immersion activities at home. We review this data prior to travel and attempt to distill design and planning precepts/design implications, and sometimes even fledgling site development concepts that can be tested later on site and in early charrette sessions with host country participants. These exercises often help us better understand central issues, site potentials, and also help us identify what we don't know and what we need to further investigate. We believe that designers gain insight and inspiration from a variety of sources. An essential part of our design and planning process occurs during pre-design research. We involve our hosts during this phase, and information garnered from a variety of sources is reviewed

<sup>4</sup> Shibley Robert G., "Architectural Excellence: Framing the Debate", In: *In Search of Design Excellence*, Ed: Shibley R., (Washington D.C., AIA Press, 1989); Pena W. and Parshall S., *Problem Seeking: An Architectural Programming Primer*, (New York, John Wiley & Sons, 2001); White E.T., *Introduction to Architectural Programming*, (Tucson, Arizona, Architectural Media, Ltd., 1972); Prince G., *The Practice Of Creativity*, (New York, Collier Books, MacMillan Publishing, 1972); Lawson B., *How designers think: the design process demystified*, (Architectural Press, 1997).



and incorporated into the design intentions of our teams of landscape architects, MBA's, planners, and architects. Critical socio-cultural, socio-economic, environmental, functional, and identity-related issues are examined in depth through hybrid qualitative and quantitative methodologies.<sup>5</sup> Our designers then distill relevant design and planning implications from the analysis of the data collected. These bits and pieces of design ideas (precepts), are eventually incorporated into comprehensive design and planning concepts as a form of post-factum hypothesis generation. As part of our pre-design research, our teams and hosts collect information regarding clients and site through extensive case study analysis, video-tape protocol studies, and structured interviews and questionnaires. We also undertake exhaustive site inventories, as well as user-group analysis of the site and surrounding context. During contextual analysis we spend a great deal of time on and around the site as non-participant and participant observers. Some methods we employ approximate those of ethnographers and are qualitative in nature, while others are quite factual and employ low inference descriptor variables. We begin with a large scale contextual analysis—looking for key factors surrounding the site that may influence our design decisions within the site. This may involve detailed analysis of aerial photographs and G.I.S. data. We also photograph the entire site and surrounding urban and natural contexts—looking for existing positive design features unique to the site as well as problem areas in need of attention. These photographic inventories can become quite interesting in areas that rarely see Americans. In Birzeit, one of our students was photographing children playing in a vacant dirt lot and was instantly surrounded by a large group



*Children of Birzeit*

<sup>5</sup> Lofland John and Lofland Lyn, *Analyzing Social Settings*, (Belmont, California, Wadsworth Publishing , 1984); Goetz J. and LeCompte M., *Ethnography and Qualitative Design in Educational Research*, (San Diego, Academic Press Inc., 1984); Heath S., *Ways With Words*, (London, Cambridge University Press, 1986).

of very curious children. One bold child said something in Arabic to our student and then grabbed her camera and ran into an adjacent derelict structure. The student, being the intrepid traveler that she is, immediately followed the child right into a living room to find him busily taking photos of his entire family. She was eventually invited in and shared a very pleasant afternoon with the family. That afternoon, this student began to learn the language and diminish the boundaries. On another occasion during a site inventory visit outside of Ramallah, three of our students were walking past a fire station. One of the fireman polishing an ancient fire engine yelled something and then walked toward our group. Without a common language the first few minutes were quite awkward yet the encounter resulted in an afternoon well spent singing songs and sharing a meal in the station. In this instance, the common language was i-tune generated. We try and develop a very opportunistic environment regarding design and the generation of design “ideas”. Even during data collection and site analysis activities we encourage idea formation. We are continually looking for anything that will give us meaningful lines on paper or monitor. As a summary task of the “pre-design” phase, all participant data collection teams make detailed presentations of their findings to all other Tejido and host design team members. In this manner information is disseminated to all participants and collective design synthesis can begin. These presentations include extensive review of all design precepts generated during the collection and analysis phases. As mentioned, our process encourages design activity throughout data collection and analysis. One general guideline we use is that analysis of fact is incomplete without discussion of the design implications generated by the existence of said fact. These implications are discussed, developed, and faithfully recorded for future synthesis activities. Our international projects most often manifest themselves as intense three or four week charrettes. In this foreshortened scenario, we are most interested in formative not summative feedback. We understand the importance of host and client participation, and that formative feedback and thorough research designs are essential to distinctive design products.

## Concept Generation

This phase asks that each individual participant attempts to synthesize issues uncovered during inventory and analysis into cohesive planning and design concepts. The individual concepts are reviewed in exhaustive design synthesis sessions. Focus is maintained on idea-building activities where reviewers are charged with the task of making each concept “better”. Hosts and clients are fully involved during these “formation” sessions. The relative merits of various design ideas are then evaluated according to a variety of design and planning ordering systems that we have embraced over the years. We ask ourselves the following questions:

- Is the design economically viable? Does it create jobs and income sources for the community?
- Is the design environmentally sensitive? Does it connect or enhance existing ecosystems? Does it create new habitat? Does it reduce our carbon footprint?
- Does the design create opportunities for meaningful social exchange and learning? Does it embrace the heritage of a site?
- Does the design circulate effectively? Is it safe? Is it easily maintained?
- Has the design identified and created an aesthetic sensibility appropriate to the history and culture of the region and its vision of the future?

These ordering systems are a form of checklist embedded in our design process, and we believe that an idea’s relevance and usefulness increases according to the number of different ordering



*Design Sessions with Tibeh*

systems that it engages.<sup>6</sup> For instance, an idea that concerns itself with only aesthetic issues is not as useful as an idea that fully engages not only spatial and image-related issues, but also explores economic, environmental and social issues as well. A park with flowers is fine, but a park with flowers that meanders its way through a community increasing adjacent land values, creating economic infill incentives within existing infrastructure, mitigating erosion, promoting urban water harvesting, and encouraging meaningful social interaction is a richer, more layered and therefore more relevant concept and eventual urban component. The “best” ideas are recorded, and in subsequent group and individual charrettes, they are synthesized into 2 or 3 optimum solutions. At this point, client review is once again paramount, and alternative concepts are presented in three dimensional detail, including story boarding and digital modeling. Once again, we are interested in formative not summative feedback, and we have found that client feedback is more lucid and fluent when presented with a series of easily understandable images and models rather than two dimensional plan and section drawings.



*Watching the World Cup in Ramallah*

<sup>6</sup> White E.T., *Ordering Systems: An Introduction to Architectural Design*, (Tucson, Arizona Architectural Media, Ltd., 1976); *Introduction to Architectural Programming*, (Tucson, Arizona, Architectural Media, Ltd., 1972); Koestler A, *The Act of Creation*, (London, Penguin, 1964); Dinham Sarah, “Teaching as Design: Theory, Research and Implications for Design Teaching”, *Design Studies*, Vol. 10 no. 2, (London, April, 1989); “Architectural Education: The Possibilities for Research on Architecture Teaching,” *Architectural Record*, (April, 1987); “Architectural Education: Is Jury Criticism a Valid Teaching Technique?” *Architectural Record*, (November, 1987).



## Concept Development

During this phase, team members are asked to divide themselves into concept development teams according to their personal philosophical alignments regarding the alternative concepts at hand. Each of the alternatives will then receive additional attention. Prototypical focus areas located within the planning concept are identified and developed in greater detail. Ideas from these focus areas may have application to other areas contained within the concept. Ideation has been known to stall at times, and as design inevitably demands recursion, we may jump back into individual or group charrette activities. At other times, we might revisit data collection and analysis phases to better inform our process through the collection of new information or the analysis of old data through new eyes. Internal/external reviews are exhaustive and involved during this period. It is critical that participants have mastered small group dynamics by this stage in the process. Respect and positive idea building are the tools of choice during exhaustive and potentially contentious design tasks.<sup>7</sup>

## Working Environment

We have been fortunate to have had the opportunity to explore and at times, develop new collaborative environments and methods of design. We have found that above all else, the process should remain fun; it seems that we often forget what initially drew us to the design professions. This usually means equitable opportunity to participate and share ideas in a respectful and energetic learning environment. Collaborative design can be a miserable experience,



*Site Team in Nablus*

or it can be delightful. We believe that enthusiasm for the material, the process, and the people involved in design enables us to effectively build learning environments where ideas flow freely, unimpeded by excessively harsh criticism, and where the advantages of collaboration are consistently apparent. In this context enthusiasm can become motivational, and could be described as an enabling process where participants listen, question, reflect, empathize, and advise in sincere, non-manipulative manners. The task is to look for strengths and possibilities rather than core-defects and inevitabilities. Given the complex nature of the global political, socio-economic and environmental contexts within which we often work, internal and external cultural and political schisms are at times all too apparent. Yet conversely, we often find that cultural and professional commonalities also emerge and become increasingly apparent to all

<sup>7</sup> Hirokawa R. and Johnston D., "Toward a General Theory of Group Decision Making", *Small Group Behavior*, Vol. 20: 4, (Sage Publications Inc., November, 1989), pp. 500–523; Smith H., "Group Versus Individual Problem Solving and Type of Problem Solved", *Small Group Behavior*, Vol. 20: 3, (Sage Publications Inc., August, 1989), pp. 357–366

participants involved. We also find that these experiences begin to catalyze better understanding of the potential influences and confines inherent in our design and planning professions regarding their ability to effect meaningful change in urban and small town fabrics. We seek to develop learning environments where mutual interests become increasingly apparent; where participants begin to realize that they are in the process of acquiring an array of global professional skills capable of effecting consequential change; and if we are fortunate enough, an environment where a shared sentiment begins to emerge that we are a part of something significant and enduring.<sup>8</sup>

## Product

The following is a brief discussion of products resulting from our processes. We will also attempt to point out and discuss defining moments in the development of our design ideas as well as in the maturation of our students into global practitioners and citizens of the world. In both Palestine and in Panama we were pleased with the relevance and usefulness of both our design and pedagogic products. Several of our students are now living and working in both locations following these projects. This spring semester, Panamanian faculty and students are visiting our University to participate with us on local projects in Arizona. This reciprocation is difficult for the Palestinian students as visa issues have prevented their travel to date, but we will certainly keep trying to make this work. In Panama our client was the Governor of Panama, Mayin Correa, and she received our revitalization master plan with enthusiasm. The design has gone through a preliminary cost estimating process and will be presented to the President of Panama-Ricardo Martinelli for approval this coming December. The Palestine project was very well received by the Mayor of Birzeit-Yusef Nasser, RIWAQ and UNRWA. As funding is a critical issue for the Palestinians, we created a “modules of development” phasing strategy for them that allows the project to be employed through a number of discrete developmental packages that can be initiated individually given the appropriate political and economic environment. We hope you enjoy this very brief introduction into project outcome.

<sup>8</sup> Culbert S. and McDonough J., *Radical Management*, (New York, The Free Press, 1985); Amos Rapoport, “There is an urgent need to reduce or eliminate the dominance of the studio,” *Architectural Record*, Vol. 172: 11 (October, 1984), pp. 100–103; Frederickson M.P., “Design Juries/A Study in Lines of Communication”, in: *Journal of Architectural Education*, Vol. 43:3, (Spring 1990); Frederickson M.P., “Gender & Racial Bias in Design Juries”, in: *Journal of Architectural Education* Vol. 47:1, (September, 1993); Bowser W., “Reforming Design Education,” *Journal of Architectural Education*, Vol. 37:2, (winter, 1983), pp. 12–14; Rogers Carl, “Personal Thoughts on Teaching and Learning,” In: *Freedom to Learn: A View of What Education Might Be*, (Columbus, Ohio, Merrill, 1969); “Communication: Its Blocking and Its Facilitation,” (*Etc: A Review of General Semantics*, Vol. 9, Winter, 1952) pp. 83–88.

## Panama/the Revitalization of Avenida Central



*Team Panama with Governor Mayin Correa*



*Avenida Central/Panama City*

In the summer of 2011, the Tejido Group from the University of Arizona assembled a group of volunteer students from both the Schools of Architecture and Landscape Architecture & Planning to develop conceptual design solutions for a distressed urban corridor in Panama City, Panama. The project was a collaborative effort among students and faculty from both the University of Arizona and la Universidad de Panamá, and the offices of Governor Mayin Correa. The project was focused on the development of a revitalization master plan for Avenida Central, including urban connectivity strategies with the surrounding urban fabric of Panama City. With strong support from the governor's office, the students, faculty and professionals involved experienced a number of unique design challenges resulting in experiences which fostered both academic and personal growth. The Avenida Central revitalization project evolved into an attempt to develop a "sustainable urban living" prototype that may also have relevance to other distressed neighborhoods in this rapidly growing urban environment.<sup>9</sup> Avenida Central has the potential to become a main artery in the organizational body of Panama City. This pedestrian corridor acts as the transition point from the old to the new—Casco Viejo to contemporary Panama City. The design of this corridor is intended to embrace and integrate traditional and historic aspects of Panamanian culture, while at the same time, develop a new model for sustainable urban living; an urban environment that approaches sustainability across a number of dimensions—economic, cultural, functional, and environmental criterion.

<sup>9</sup> Beatley T., *Green Urbanism/ Learning from European Cities*, (Island Press, Washington D.C., 2000); Waldheim C., ed., *Landscape Urbanism Reader*, (New York, Princeton Architectural Press, 2006); Mougeot L., *Growing better cities: urban agriculture for sustainable development*, (Canada, International Development Research Centre, 2006); Doucet I. and Janssens N., ed.s, *Transdisciplinary Knowledge Production in Architecture and Urbanism: Towards Hybrid Modes of Inquiry* (London, Springer, 2011); Mostavi M., and Doherty G., *Ecological Urbanism*, (Harvard University, 2010); Mostafavi, Mohsen, and Architectural Association. *Landscape Urbanism: A Manual for the Machine Landscape*. (London: Architectural Association, 2003).



*Proposed Kiosks along Avenida Central*

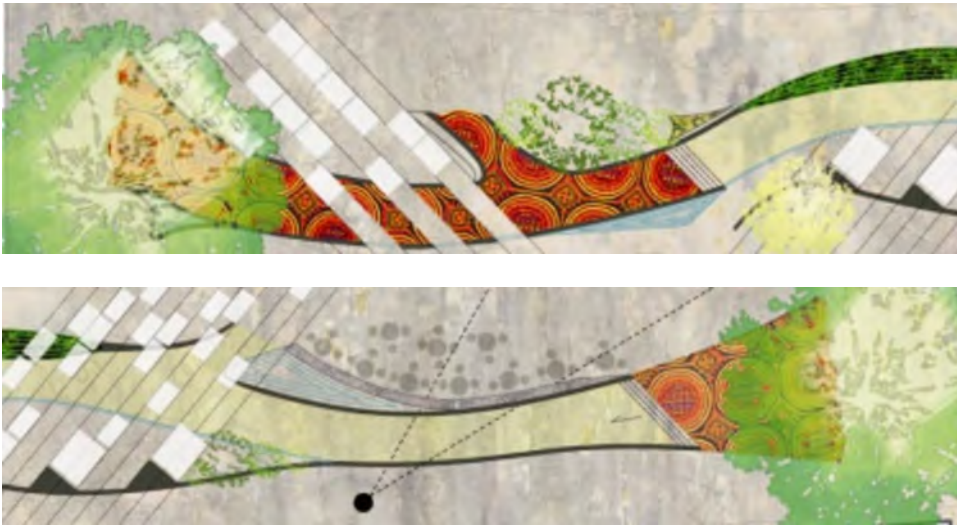
As it exists, Avenida Central is utilized for commerce and as a simple means of getting from one end of the street to the other. It is beset with many problems, and in order to activate/re-vitalize this corridor, many elements need to be taken into account. These include, existing site conditions, connections into the existing urban fabric, cultural integration, economic opportunity, pedestrian and vehicular circulatory as well as environmental degradation issues.



*Portable Kiosks*

The design is meant to offer potential solutions to these issues in order to add dimensions of sustainability to Avenida Central and create a focal point for the City. The main concept of this design is to create an efficient yet delightful street environment as well as offer flexibility; this is most evident in the division of the avenue. There are three lanes that are dedicated to various usages. The two outside lanes are meant for the expedient user, shopper or as a service lane, with the meandering center lane dedicated to relaxation and urban respite. The serpentine form that creates the three lanes responds to the urban context in very specific ways. For example, green pockets, water features or seating can be used to slow people down to showcase a piece of historic architecture or draw one's attention to certain programmatic functions. Another example is a lane opening into a series of stairs that can be used as a small amphitheater for a spontaneous performance. Elevation changes are also utilized to create different experiences and offer opportunities for different degrees of privacy and socialization throughout the streetscape. We are envisioning this street area as a form of urban green belt nimble and responsive to a myriad of municipal needs. Another important concept of Avenida Central is the "kioscos" and how they function. This is a major factor in assisting Avenida Central's economic sustain-

ability. They offer jobs and bring people into the site for produce and a number of different products. In order for the vendors to be successful, they must be mobile. The proposal is a semi-permanent structure that doubles as a shading device and specified modular kiosk space. The structure can be removed and stored in the hardscape to allow for a new programmed space to emerge in their place. When the structure is deployed, there can be more permanent kiosk space that the mobile kiosks can pull into, or restock at their main kiosk space. The corridor carries a strong concept of water throughout its entire length. It starts with one collection point at Plaza Santa Ana that begins to divide and pool at opportune moments. This brings an element of movement and tranquility to the site, and bio-swales strategically located throughout Ave. Central can double as water filtering systems that can then be used as participatory water feature for children's play. In the larger areas of the avenue the water can begin to branch and move in and out of the hardscape.<sup>10</sup>



*Kiosks and Paving Patterns along Avenida Central*

<sup>10</sup> "The Tejido Group/Avenida Central", last modified July, 2011, <http://www.tejidogroup.org/PANAMA%202011/Panama%20final%20small+coverX.pdf>

## Plaza de 5 de Mayo



*Monument at Plaza de 5 Mayo*

This plaza stands at the northern anchor to the pedestrian corridor along Avenida Central. Unfortunately, the commemorative monument honoring the tragedy of El Povorin is currently isolated, severed by rows of vehicles. This is why the design proposes a garden gathering point, rather than an island surrounded by automobiles and trucks. We also suggest that by relocating the monument thirty meters to the West, its presence can be celebrated in a park-like environment and that it can also signify the beginning of the pedestrian axis along Avenida Central. It will now stand as an iconic anchor located at the end of the pedestrian corridor. The axis continues, marked with thematic vegetation, marching across Calle B and terminating in front of the Anthropological Museum. The playful ambulation of mola (indigenous Kuna designs) paving patterns and planters help to draw people along the facades and to the threshold of our project area. The monument opens up to a reflecting pool set into a recessed stage, thereby allowing for its traditional use as a platform for congressional events. On a daily basis however, this space would create opportunities for strong social exchange given the variety of urban spaces and platforms integrated into the site. These ideas represent a design solution for the immediate future, a term we're referring to as a 'one-year plan'. More elaborate designs, one that may include a profound redirection of traffic, or transitional underpasses, are viewed as 'ten-year plans'. Given the complexity, the design would ideally grow toward these goals.



*Proposed Market at Calle J*

### ***Intersección de Avenida Central y Calle J***

This intersection presents an excellent connective opportunity between the pedestrian corridor and Cerro Ancon, including the Smithsonian institute. Through view sheds, vegetation and compatible architectural strategies, this connection can create a processional blending of the vibrant commercial street scene and a natural and education setting. The first design response would be to incorporate a vehicular turn-around, close off vehicles from the intersection and also allow pedestrians to move freely. The drop-off point would serve as an arrival and departure node while still maintaining adequate room for loading and service. Here, existing kiosks and parking structures are reorganized and incorporated into a new urban space. This design gesture serves a dual purpose. While it allows for traffic decompression, it also reactivates previously unavailable amenities, including athletic courts, a nursery, a recycling and compost center, public rest rooms and a small amphitheater. The park space is organized through a hierarchy of circulation patterns for different user groups. Each path will be supplemented with natural and interpretive educational elements, celebrating Cerro Ancon and metaphorically growing towards Avenida Central.

### ***Intersección de la Panamericana***

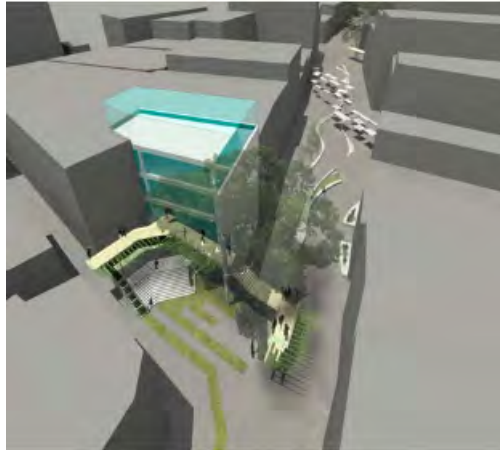


*Pedestrian underpass at the Pan American intersection*



Acknowledging both the growth of the city and of the population, the traffic of this intersection is likely to increase. In anticipation of this growth, the design illustrates an evolution from the previous, exemplifying what we're referring to as a 'ten year plan'. The implantation of an underpass would accommodate two circulation flows, offering a more casual pace for crossing pedestrians. The vehicles meanwhile, could maintain a moderate speed to keep traffic flowing. The underpass would mark the celebration of the ever present rainfall. The collection of rain water would start with a steady flow of descending water running through purification bioswales, until it culminates in a waterfall. The cascading water would be highlighted along the stairs, thus inviting pedestrian to enter the underpass. Once inside, pedestrians are given the opportunity to observe the movement of water, as it moves through the space with playful swirls, directly illuminated from above with natural lighting. A primary component to this design is the allotment for additional vendor space arranged along the underpass. These areas designated for the kiosks have an opportunity for permanence given the perimeter structure. Considering the potential flow of traffic, this would be an ideal economic situation. Given the amount of rainfall, this space would of course have to be engineered appropriately, acknowledging potential flooding.

### ***El Relleno Dos***



*Mixed use infill along Avenida Central*

In this area, there is a unique problem given the numerous amounts of mobile food vendors and the inadequate seating space associated with them. The concept of shade, blended with a



compelling atmosphere of gardens, art and a proximity to the pedestrian corridor, is the primary design response in this infill strategy. The adjacent slope of Avenida Central creates the perfect opportunity for orientation.

In response, elevation was used to place the pedestrian above the flow of traffic, allowing them to view the social dynamic from a unique perspective. The ground level plaza provides one the sole opportunity of relaxation off of the Avenida itself. This setting of relaxation is augmented with shaded multi-use tables, a sculpture garden, and a café. Urban agriculture is used as the economic driver in this location, supplementing an existing need with the potential for social exchange as well. The rooftop greenhouse creates the produce, the market sells the produce, the café prepares the food, and ultimately, the pedestrians purchase the food, enjoying the atmosphere as they are exposed to art and culture all the while.

This was a wonderful experience for all of us on many different levels. We have all grown a great deal, both personally and professionally. The Avenida Central project was a relevant and timely project in which we were both challenged and inspired to do our very best to offer our clients conceptual design alternatives that approach sustainability on many different levels. It has been our intention to generate solutions that are relevant to this urban culture and site context that will perhaps suggest prototypical strategies for sustainable urban living. Accordingly, our designs seek to develop revitalization strategies for Ave. Central along the following dimensions: Economically, by creating jobs and opportunities for locally owned businesses to prosper and compete effectively with corporate entities; Environmentally, by reducing the carbon footprint of its inhabitants in creating a place where one could work, live, and produce consumables all within walking distance; Socially, by creating a neighborhood where history and learning are celebrated on every corner; where youth can learn and interact in socially relevant ways with one another, and where opportunities to enjoy natural open space are ever present; Functionally, by creating design concepts that circulate efficiently and are pedestrian focused in nature; where our design solutions are durable, easily maintained as well as safe and secure.

### ***Palestine/Urban Connectivity in Birzeit***

During the summer of 2010 the Tejido Group from the University of Arizona assembled a group of volunteer students from the University's College of Architecture and Landscape Architecture to collaborate on a series of projects in Palestine with RIWAQ / Centre for Architectural Conservation and Al-Najah University in Nablus. The groups focused on developing urban revitalization and connectivity strategies for historic Birzeit near Ramallah, Palestine. It was a wonderful experience for all involved.<sup>11</sup>



*Palestine Team in Ramallah*

The following is a brief summary of the design and planning outcome of the collaborative effort in Birzeit. As requested by RIWAQ, one primary goal for this project was to build off of previous RIWAQ research and generate community revitalization and development concepts that could be coalesced into relevant master planning and design options for Historic Birzeit. One of the missions of RIWAQ is for historic buildings and centers to be seen as an important tool for economic and social development, and to change the existing local belief that they are a liability to progress. In response to that mission, Tejido spent a week in orientation meetings with RIWAQ and as non-participant observers of the cultural, socioeconomic, functional and environmental interactions throughout the town of Birzeit. Then, within a three week time frame, Tejido and students from Al-Najah University developed a conceptual master planning framework for the integration of the new and historic town centers of Birzeit based on a variety of landscape urbanism urban agriculture and urban infill strategies.<sup>11</sup>



*Historic Birzeit*

The following summarizes select design and planning concepts offered to RIWAQ, and the Town of Birzeit for their review. These interrelated concepts range in scale from urban connectivity and economic revitalization strategies to specific designs for mixed-use infill and student housing. During analysis, activity nodes of significance that are both well-utilized and under-utilized were identified. As separate entities, these spaces are either non-functioning or could be enhanced by developing definitive relationships with adjacent nodes. The connections among these nodes represent the first dimension of the plan. The second is the connection, and therefore at times creation, of green zones and open spaces; a network of green was created to form the links among nodes, open spaces and existing dwelling and commercial activities within both new and historic Birzeit. The third dimension of the plan offers more specific architectural and landscape architectural solutions to an array of historic structures, infill opportunities and open spaces located throughout the Historic Center and the surrounding Birzeit urban fabric.

### **Existing Conditions**

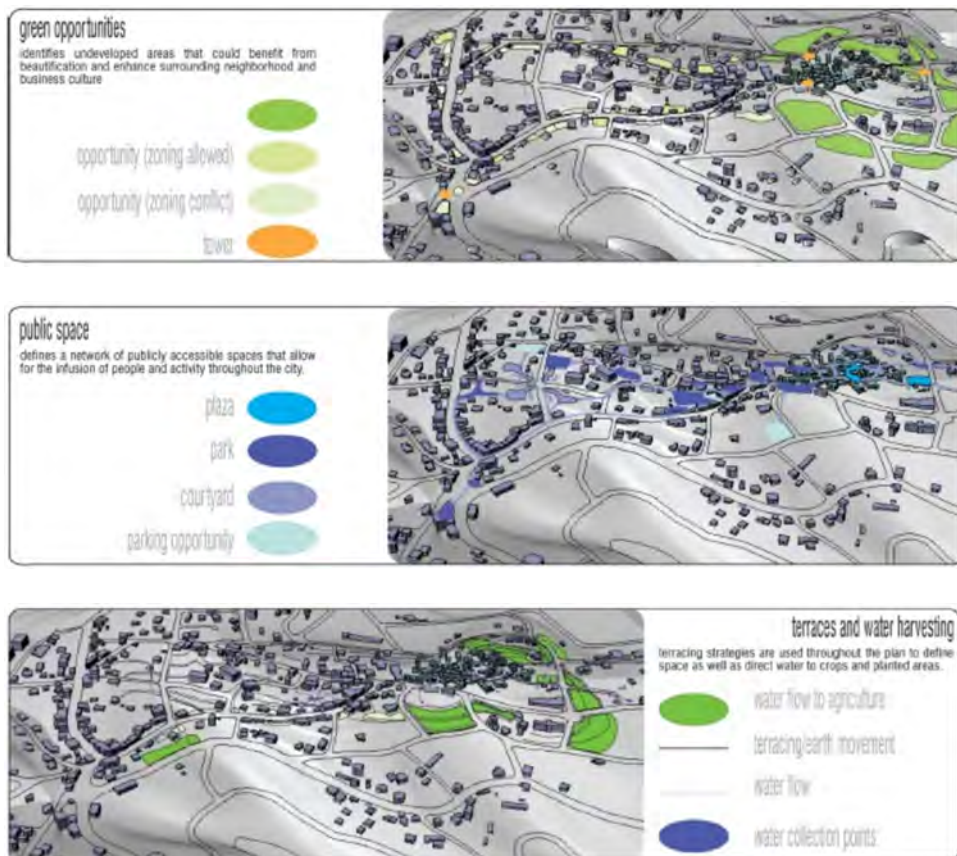
The site revealed that much of the social and economic vitality that once permeated Birzeit had quickly disappeared when Birzeit University relocated their campus nearer to Ramallah. Consequently one primary charge was to vision means of economically and socially revitalizing the town. Without the large student population present, both businesses and cultural life grew stagnant. Historic Birzeit was largely abandoned and remained disconnected from “New Birzeit”. The historic section was perceived by the majority of citizens as an inconvenient eyesore, and

<sup>11</sup> “The Tejido Group/Birzeit”, last modified July, 2011, <http://www.tejidogroup.org/BIRZEIT/BIRZEIT.htm>

as an area ripe for razing and subsequent development. New construction within Birzeit was relegated to linear strip development along the highway to Ramallah. As is the often the case, street layout and design only reflected the growing increase in vehicular traffic and neglected pedestrian connectivity and open space potential that exists throughout the town. Many of the structures in historic Birzeit were not designed for modern living and were consequently abandoned, and the old stone structures throughout the campus of Birzeit University lay empty and decaying. Adaptive reuse strategies had not yet been explored. Another key issue for consideration was that the area surrounding Birzeit was once filled with agricultural activity where groves of olive and apricot flourished, but now developmental pressures from the surrounding context saw Birzeit as a potential bedroom community for rapidly urbanizing Ramallah.

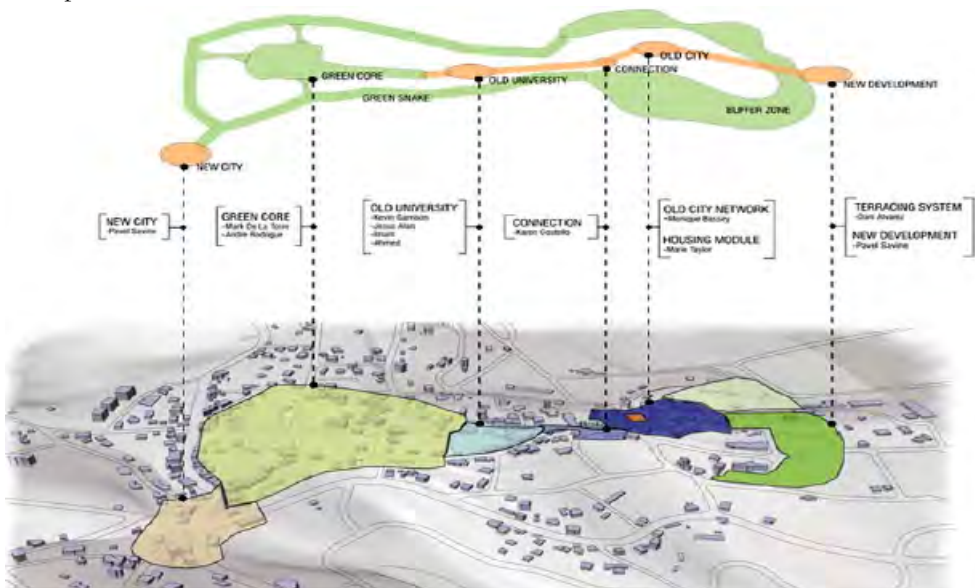
## Proposed Strategies

Due to the limited format here, the following is a very brief summary of select revitalization strategies contained in our final master planning document. In response to our analysis of existing conditions we sought to develop our design ideas in a layered and comprehensive manner. At an urban scale we revised existing land use surrounding and within Birzeit.





As a means of ensuring the historic identity of the village from encroaching urban development, we surrounded Birzeit with a green buffer zone derived from open space and publically owned land. This green zone contained recreation and open space opportunities as well as components of urban agriculture including restored orchards of olive and apricot arranged on stone terraces and integrated with water harvesting strategies. We developed block interior residual space into a pedestrian network of plazas and parks that responded to adjacent land uses i.e. residential, civic, commercial and educational. This network directly connected new Birzeit with historic Birzeit with a series of urban and historic trails that were in turn linked to public transit hubs. We developed many ideas for adaptive reuse including relocation of Birzeit University's existing architecture and theater arts programs back into the old campus and adjacent to historic Birzeit. Economic revitalization strategies included new infill student housing within and adjacent to historic Birzeit; farmers and artisans markets located near agricultural activity within the green belt surrounding Birzeit; sustainable tourism scenarios tied to the large numbers of tourists visiting nearby Jerusalem. Contemporary stone terracing is incorporated into the surrounding green belt. This concept not only provides a visual cohesion to the town but also contains orchards of economically viable produce adjacent to strategically located farmers and artisan markets. These terrace designs are also integrated with water harvesting and storage concepts.



## Focus Areas

During analysis, activity nodes of significance that are both well-utilized and under-utilized were identified. As separate entities, these spaces are either non-functioning or could be better enhanced by developing definitive relationships with adjacent nodes. The connections among these nodes represent the first dimension of the plan. The second is the connection, and therefore at times creation, of green zones and open spaces; a network of green was created to form the links among nodes, open spaces and existing dwelling and commercial activities within new Birzeit. The third dimension of the plan offers more specific architectural and landscape architectural solutions to an array of historic structures, infill opportunities and open spaces located throughout the Historic Center and the surrounding Birzeit urban fabric. As our time in Birzeit was limited to four weeks, our analysis helped us identify several key focus areas which merited more detailed design. The following is a discussion of select focus area design outcomes.



## New City Entry Area

As the ideal entry point into Birzeit (old and new), this was an opportunity for us to differentiate this area as a symbolic portal and introduction of an architectural language that continues throughout the town. We chose to work with historic precedents, i.e. ancient terracing and watch tower forms, and develop these into contemporary metaphors that act as entry elements—an announcement of the presence of historic Birzeit as a place and focal point within the community. This area was also developed into a multimodal bus and taxi hub to provide greater orientation and alleviate downtown disorder and congestion. The design incorporated and introduced a native plant palette along with a system of bio-swales and water harvesting concepts integrated into the terracing.





### Old University Campus Area

The proposed design for the Old Campus focuses on revitalizing the open spaces and in turn, the adaptive reuse of buildings adjacent to them. By maximizing the use of the spaces year round, the Old Campus can help define and revitalize Birzeit. A central concept of the design of this area suggests the return of the previously relocated schools of architecture and performing arts to a revitalized campus home. This would return both the economic and cultural vigor of student living to Birzeit. In keeping with our sustainable tourism development concepts for Birzeit we also suggested that a small hostel/hotel be developed here to serve the University as well as visitors to historic Birzeit. Day care, children's play areas, urban gardens, and a large events facility were also placed here to accommodate a range of programmed events such as the olive harvest, the annual Birzeit music festival, and other social gatherings. Pedestrian corridors accessible to the public connect a series of urban open spaces throughout the green core and the campus, thereby enticing villagers and visitors alike into the campus and adjacent historic center. A dynamic business market was also proposed to help create new jobs and pull income from external markets, at the same time serving to diversifying Birzeit's local economy. Environmentally it was important to reduce the heat island effect through a reduction of paved surfaces and large area shading strategies that were also coupled to integrated water harvesting concepts. Generally, we sought to develop the old campus into a series of open spaces and gardens surrounded by historic structures that house relevant contemporary functions. We saw the campus as a continuation of pedestrian links that run from new Birzeit on the west, through the green core area, the old campus and onto and through the historic district to the west. This area has the opportunity of becoming an urban respite as well as a cultural center that attracts visitors from adjacent urban areas, i.e. Ramallah and Al-Bireh.



*Amphitheater at the Entry to Historic Birzeit*

### Historic Birzeit

The proposed design seeks to give the Historic Town Center a strong focal area and anchor all of the attractions into a central point. It proposes to widen the road, build a roundabout and drop off point. It also proposes to build a small plaza over a centrally placed vacant building and use the land for an open air theatre to be used by the town and the University's theater arts program for cultural, social, public and private gatherings. The drop off area next to the plaza makes it easier to reach the center of the Historic center. Taxis can drop off or pick up by the plaza and then return via the roundabout. This should lead to an increase in traffic, and business, to the area. The building below the plaza will be in a prime position for business. A business such as a restaurant that caters to weddings and other special events could become an important employer for the town. The plaza and terraces can accommodate all types of ceremonies. A successful caterer could buy locally produced agriculture, further strengthening Birzeit's economy. The greenhouse and land below could also support a plant nursery. The amount of building development within a 20 mile radius could support such an endeavor.





The plaza serves as an entry point to the town. The views from this vantage point are wonderful, and the area can be easily closed off to traffic for large functions. The roundabout and drop off area encourage people to use the multi-functional outdoor terraced theatre-a flexible space, suitable for all types of events. The proposed watchtower is a reminder of Palestine's historic building types, and the arcaded seating areas are also an acknowledgement of Palestine's architectural heritage. We believe this area is a critical introduction to historic Birzeit, and although the plaza and terraces are perfect places to sit and enjoy the views and nature, we have designed it to also deliver, gather and entertain large groups of citizens, students and tourists alike.



*Infill student housing in Birzeit*

## New Development and Urban Agriculture

In this west end area of the site, we have once again introduced terraced crescent forms that serve as circulation links among open green spaces. The shape, changing heights and placement of the forms reinforce the “green buffer” concept, simultaneously creating job opportunities for locals to participate in urban agriculture. The design for the northeast crescents draws from



the ancient use of agricultural land terracing surrounding the city of Birzeit. The forms are developed from attention to topography and land ownership. They create opportunities for urban agriculture thereby creating job opportunities for the community. In addition to urban agriculture, native Aleppo pines can be planted as a symbol of history and culture in Palestine. The placement of the housing units utilizes the existing stone walls of the terraces as a thermal massing strategy. Modernity is referenced through the use of steel structure and shades, providing a benefit to local metal workers. In addition to providing shade, steel louvers can also be used for growing produce. Operable windows and cross ventilation strategies are utilized to keep cool and eliminate the need for central air conditioning. Thermal comfort is also provided by proximity to trees that create a cooler micro-climate. Level changes and shared courtyards reference the ancient buildings in the area, and more spaces are created for spontaneous social interaction. The clustering concept of the proposed development continues the Old City ethic of high density development, and the construction is low-tech and could use the local labor force. The planting of a 'green agrarian-based buffer' surrounding this area creates incentive for the continuation of traditional agriculturally-based activity and new local jobs. The clusters contain structures that also house machinery and farming supplies that support the cultivation of the buffer. Two vocational/adult learning schools are also in this new development area as well as play spaces for children. Adults learn, while children are nearby and occupied. Pines and other produce bearing trees, in combination with stone-walled terraces, subtly announce the historic center of Birzeit. In addition to urban agriculture, landowners can generate income by building and renting small residences. Built form in this area should be controlled, and housing units should maintain specified building heights and areas in order to protect the agriculture and preserve the beauty of the city's historic center.



*Mixed use infill along new terraces*

## In Conclusion

We often work in complex and unfamiliar environments, yet our research and past experience in design education indicates that certain phenomena consistently appear to be productive ingredients in successful learning and teaching environments: trust, respect, enthusiasm, and ef-

fective leadership. We have also become dutiful to the notion/observation that appropriate and innovative design and planning solutions most often arise from rigorous research and collaboration. We try to make each *Tejido* undertaking an innovative research project, thereby bringing greater accountability and rigor to the process of conceiving and testing design ideas. Although we do not believe in “intuition” per se, we do understand that the more we prepare; the more we research; the more we examine alternatives; the more likely it is that we will experience that very special moment of “intuiting” myriads of variables into singularly appropriate solutions. We believe that these inclusive working environments and well-articulated processes have, in part, enabled our students to adjust and adapt to unique environmental and cultural contexts and to consistently produce innovative design and planning products.<sup>12</sup> We carefully follow the careers of past participants and strive to accurately assess post-*Tejido* growth and learning. Their insightful and consistently affirmative responses to our surveys are gratifying and also serve as an excellent means of monitoring and fine-tuning these complex learning experiences. We are currently developing a fifteen week College sponsored program in Oman for the fall semester of 2012, and a four week program in Hong Kong for the summer of 2013. Much of the itinerary, project selection and design methodologies for each of these projects have been influenced by our post-experience surveys. We will be posting more about these projects during fall semester, 2012 at: [tejidogroup.org](http://tejidogroup.org).

## ABOUT THE AUTHOR

*Dr. Mark Frederickson:* Dr. Mark Frederickson is an associate professor with the College of Architecture and Landscape Architecture at the University of Arizona. He received his Ph.D. from UCLA, and his B.ARCH. and M.ARCH. from the University of Arizona. He was a Peace Corps Volunteer, an ORS Scholar with Edinburgh University, and the recipient of three Senior Fulbright Scholar Awards. Dr. Frederickson has taught and practiced architecture, landscape architecture, and urban design in a range of cultural, environmental, and professional contexts in the United States, Europe, Latin America, and the Middle East. He is also the director of the Tejido Group, an international and interdisciplinary community outreach design and planning program at the University of Arizona.

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<sup>12</sup> “The Tejido Group,” last modified July, 2011, <http://www.tejidogroup.org/>

*The International Journal of Design Education* is one of six thematically focused journals in the collection of journals that support the Design Principles and Practices knowledge community—its journals, book series, conference and online community.

The journal explores aspects of learning to become a designer and to develop modes of “design thinking”. It explores design strategies, methodologies and tactics. It analyzes forms of professional stance. And it examines pedagogies of engagement with design purposes, designed objects and design.

As well as papers of a traditional scholarly type, this journal invites presentations of practice—including documentation of curricular practices and exegeses analyzing the effects of those practices.

*The International Journal of Design Education* is a peer-reviewed scholarly journal.

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# ARCH

10YEARS ANNIVERSARY

BACK IN TOWN SERIES III: TRIBUTE TO MARK  
PAUL FREDERICKSON

2012  
2022

*Loren*

# DESIGN ORDERING SYSTEMS & URBAN SUSTAINABILITY

Mark Paul Frederickson

Sustainable Design has the capacity to affect profound change in the urban fabric.

For the past ten years, we have attempted to develop our design studios into innovative applied research environments in which faculty and students collaborate in apprenticeship-style learning scenarios. Our studios have become international and multicultural experiences and have developed thesis projects on four continents.

Although we work on a wide variety of project types in an array of environmental and social contexts, we are most frequently involved in sustainable community development and the planning, design, and revitalization of urban environments. Over the years, we have developed a series of exciting design and planning methodologies that seem to serve us well in forming sustainable urban fabric. As Architecture is inherently interdisciplinary, we engage a range of design tools on any project. But, in the formation of the intelligent and versatile urban fabric, we have become very impressed with the capacity of specific planning strategies to effect meaningful change in our cities, towns, neighborhoods, and edifices.

Rüyet Sefercioğlu,  
Post-Industrial  
waterfront  
revitalization in  
Přaha. Arch 402  
2019,  
Instructor: Mark Paul  
Frederickson



## ordering systems

We have come to understand and embrace a variety of Architectural, planning, and Landscape Architectural processes as effective catalysts of consequential economic, environmental, social, and aesthetic change in urban environments. They are also remarkably effective tools for urban and small-town revitalization. Although our processes inevitably vary according to project type, client, site, budget, etc., we find that with most complex planning projects, design organizational criteria and sources of form prove quite effective as design tools.

Although we remain apprehensive regarding using the term “sustainability”, we honor it as an elusive yet worthy goal integrated into all of our planning and design efforts. We believe that a genuinely sustainable urban environment must be defined across an array of dimensions: economic, cultural, environmental, functional, and aesthetic.



Accordingly, in our more complex projects we evaluate the relative merit of our ideas according to the following design and planning ordering systems:

**Economy:** is the design economically sustainable? Does it create jobs and income sources for the community?

**Environment:** is the design environmentally sensitive? Does it connect and enhance existing ecosystems? Does it reduce our carbon footprint?

**Culture:** does the design create opportunities for meaningful social exchange and learning?

**Function:** does the design circulate effectively? Is it safe? Is it easily maintained?

**Aesthetic:** has the design identified and created an aesthetic sensibility appropriate to the history and culture of the region and its vision of the future?





Selin Şahin,  
Urban Agriculture  
and Aquaponics  
complex in Prague 7  
Arch 402 2019,  
Instructor: Mark Paul  
Frederickson

For instance, an idea that concerns itself with only aesthetic issues is not as useful as an idea that fully engages not only spatial and image-related matters but also explores economic, environmental, and social issues. A park with flowers is fine, but a park with flowers that meanders its way through a community, increasing land value, creating economic opportunities, mitigating erosion, promoting urban water harvesting, and encouraging meaningful social interaction is a richer, more layered, and therefore more relevant concept and eventual urban component.

We use these invariably interconnected systems as a means of verifying the relevance of our ideas. Our solutions must be multi-layered and satisfy the complex range of design determinants present in all urban settings. Over the years, we have understood and appreciated that landscape Architectural design and planning strategies can encourage meaningful transformation in urban environments. The ordering systems have, in turn, become our definition of sustainability.

The following is a more focused discussion of how these strategies can lend dimensions of sustainability to our design and planning ideas and improve urban environments across all of the fore-mentioned ordering systems.

**Economy:** Our work in small town and urban revitalization projects has taught us that economic viability is perhaps the most critical issue facing clientele. If our design and planning solutions are not economically sustainable, then all other ideas and well-intentioned concepts rarely gain full realization. Catalyzing economic growth and revitalization with minimal capital outlay remains a primary concern in most urban design scenarios. The inertia counter to economic revitalization in many communities effectively postpones or cancels many well-intentioned urban design projects. Due primarily to significantly lower initial costs, we have found landscape architectural solutions to be effective facilitators of economic growth and useful organizers in urban revitalization and design scenarios. Landscape Architecture is relatively inexpensive compared to urban design solutions predicated on large architectural and infrastructure-related projects. In the United States, the value of a property will almost always increase when a park, plaza, recreational opportunity, or greenway is developed next to it.

**Environment:** Environmental degradation has become a genuine problem throughout the global urban fabric. Whereas past generations of designers were focused on social equity and justice, a great majority of our incoming students are environmentally motivated. They have recognized that truly sustainable urban environments not only need to preserve and remediate existing ecologies but also need to approach carbon-neutrality in their formative principles. The good news is that the market for dense, walkable, mixed-use community configurations surrounded by preserved natural open space and recreation opportunities is rapidly expanding.

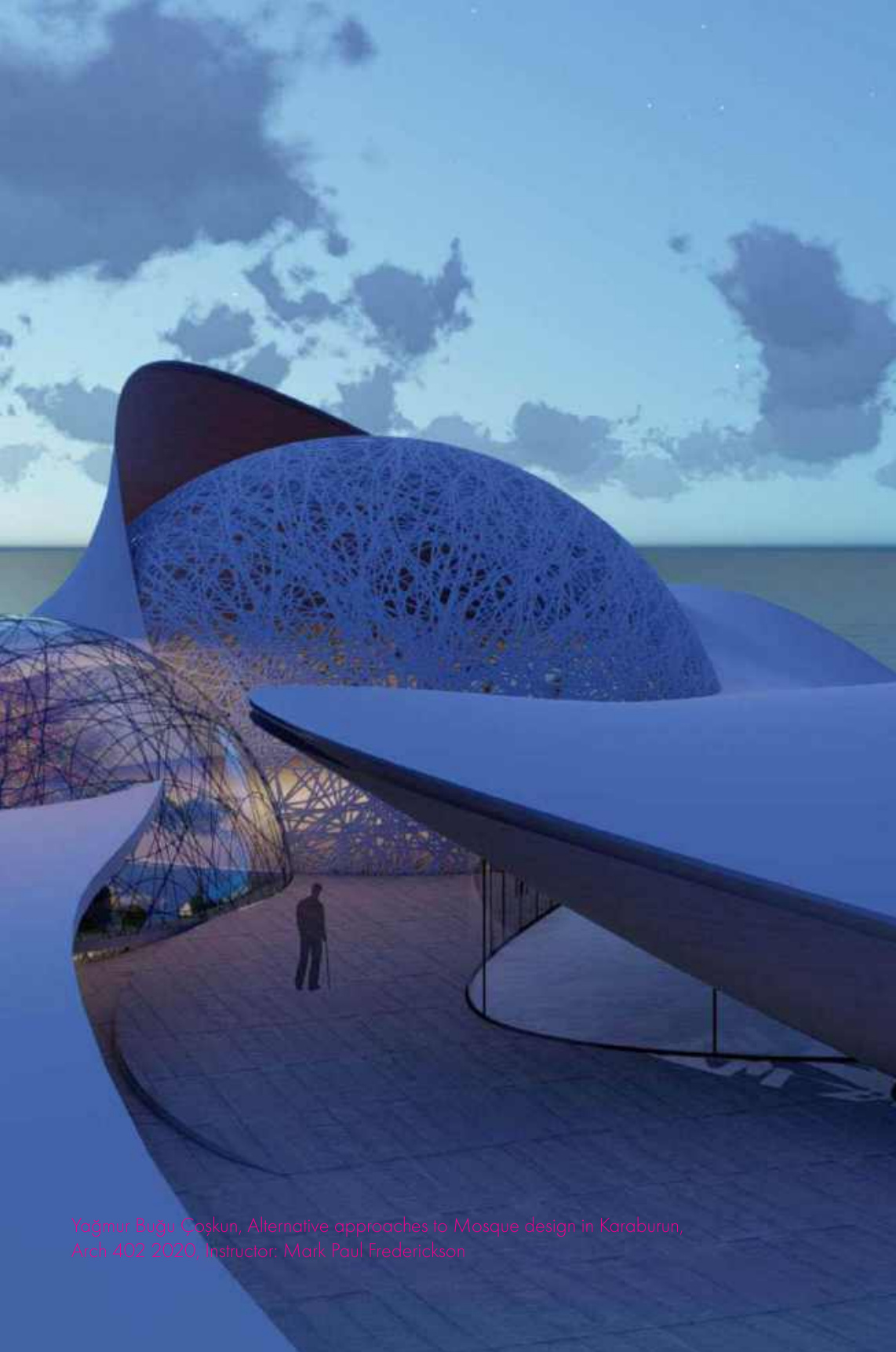
**Culture:** in most cities, we are becoming culturally isolated from one another. We view the world through our cars and television screens. Our urban fabric is formed of an anonymous grid of vehicles and garage doors with little opportunity for meaningful social interaction. We find that through the creation of interconnected green networks of parks and preserved open space as well as walkable and pedestrian-oriented streets; we can encourage meaningful social exchange. In several of our projects, socio-economic differences were an issue. For example, we have recently worked on revitalization master plans for several coastal villages where the effective economic and social integration of existing settlements into new tourism-related development became a primary component embedded in our design solutions. Landscape-based solutions proved exceptionally helpful in these complex situations.

**Function:** As previously mentioned, we consider functional issues to include the following: efficient vehicular and pedestrian circulation, user-group safety, and ease-of-maintenance issues. Urban connectivity is a critical issue in the creation of compelling urban environments. Dense, walkable, mixed-use environments that reduce our reliance on the car are paramount. Once again, one can see that green pedestrian and bicycle networks of linear parks and pedestrian-oriented streets are key design strategies. More pedestrians and bicycles in green corridors results in less traffic congestion. Centralized parking concepts connected to public transport and bicycle traffic will lead to more efficient urban transportation. Washes, streams, river corridors also offer wonderful opportunities to achieve this sort of urban interconnectivity. They offer existing unused and unclaimed open space networks that can easily accommodate pedestrian and bike trails. When this pedestrian network is coupled with effective public transportation as well as centralized vehicular and bike parking strategies, walkability is increased as traffic congestion is lessened.

**Aesthetics:** Our view and definition of “aesthetics” is a comprehensive one that necessarily considers and includes all of the ordering systems. Can an urban area be “beautiful” if:

- .. its inhabitants are financially destitute?
- .. its natural environment despoiled and unhealthy?
- .. it is choked with traffic?
- .. its citizens live in fear of crime?

We believe that a truly “beautiful” community is one in which participants reflect a sense of well-being as measured through a carefully selected range of criteria. Discovering, defining and enhancing identity are often important issues in urban design. A primary goal of our revitalization plans often includes the establishment of a “Community Face” – in essence discovering, defining, and celebrating the community’s sense of place. Defining a ‘Face’ delineates how the town/community/neighborhood meets the world and is also an important way to attract visitors to explore and enjoy the amenities the area has to offer. Further, it can be a tool both for attracting investors and for those stakeholders to market themselves. And most importantly, it can help to increase community pride and be a catalyst for the organization and care of the urban fabric.



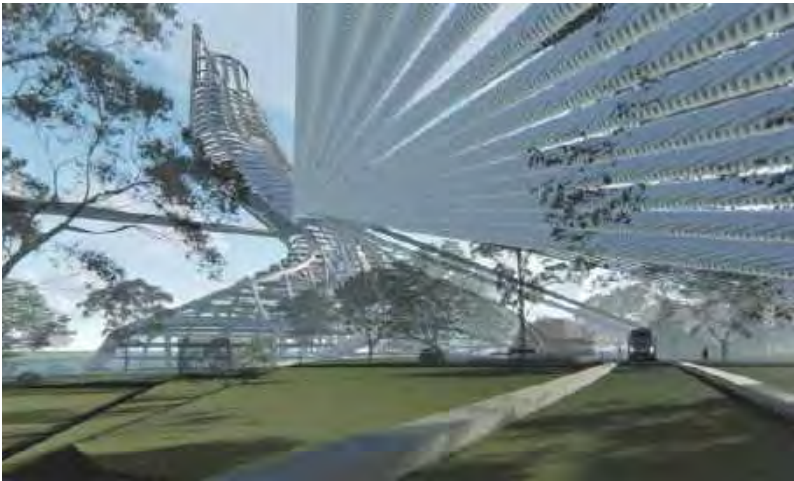
Yagmur Buğrı Çoşkun, Alternative approaches to Mosque design in Karaburun,  
Arch 402 2020, Instructor: Mark Paul Frederickson



Eda Tarakçı,  
Wastewater  
management and  
wetland restoration  
research center  
Arch 402 2019,  
Instructor: Mark  
Paul Frederickson



Naz Kaplan,  
Net zero hotel  
and wetland  
revitalization  
complex in Izmir  
Arch 402 2020,  
Instructor: Mark  
Paul Frederickson



Bünyamin Sönmez,  
Revitalization of  
urban drainage  
canals in Los  
Angeles  
Arch 402 2022,  
Instructor: Mark  
Paul Frederickson



**In summary:**

It is our experience that the effective integration of hybrid design methodologies derived from the allied design fields has the capacity to effect profound change in urban environments. And it places an array of revitalization tools at our disposal.

It can stimulate economic development with modest initial investment.

It can purify and preserve our precious air, land and water resources.

It can preserve and remediate wildlife habitat. It can encourage meaningful socialization and recreation.

It can focus growth and reduce sprawl. And it can offer an urban respite to soothe an otherwise stressful existence.

We designers are fortunate people and are in possession of skills that can positively impact the surrounding urban fabric. The students in our studios like to think of themselves as urban design street fighters, and they feel quite comfortable in “ugly” places.... it’s where we belong.

Replace grey with green and blue.

Replace cars with shoes.

Replace garage doors with front porches.

Replace noise with sound.

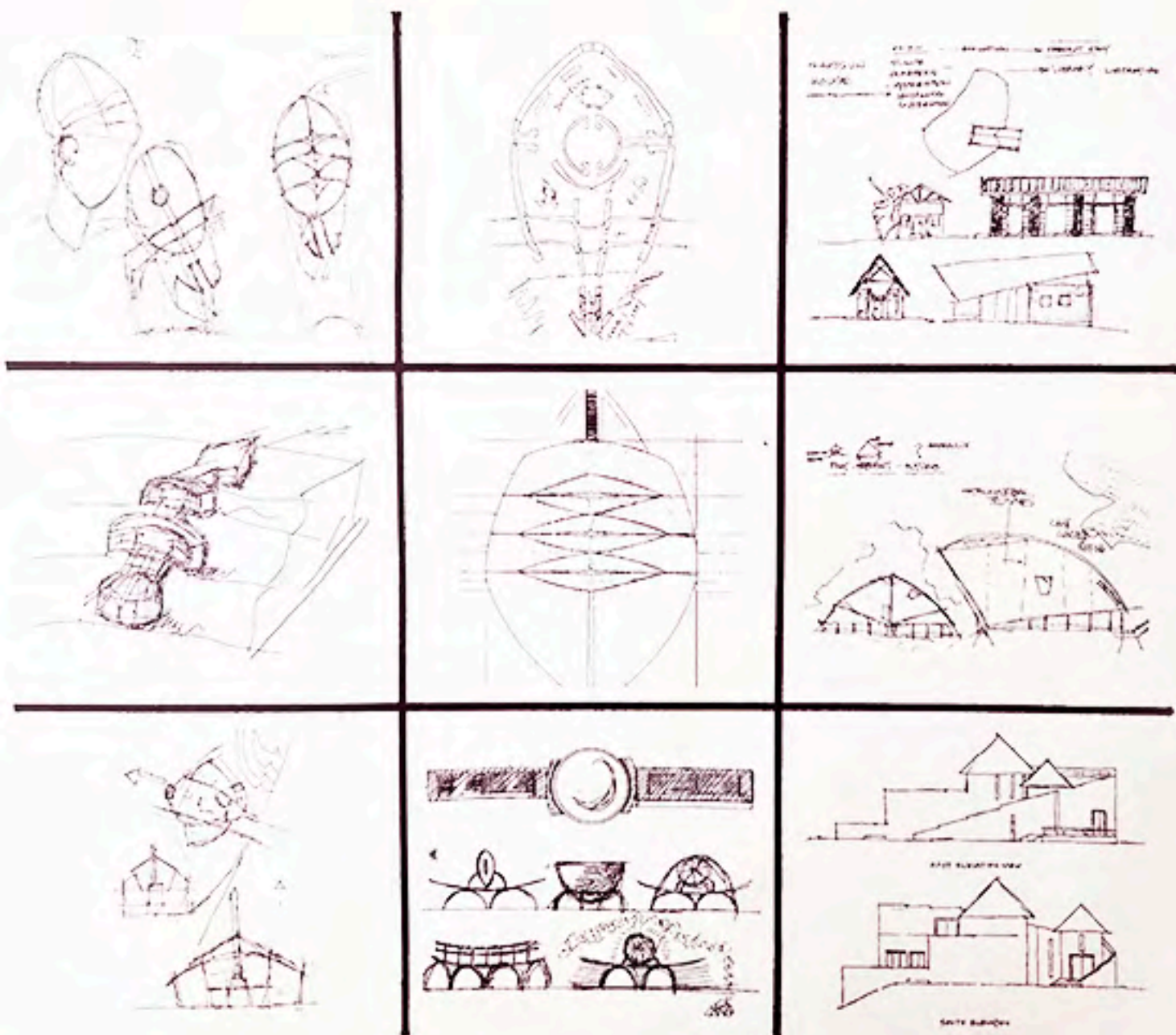
Replace concrete with parks and children playing.



# J A E

Journal of Architectural Education

September 1993



# Gender and Racial Bias in Design Juries

MARK PAUL FREDERICKSON, *University of Arizona*

**This study assesses the participation and interaction of various participants in the design jury process, that is, male and female jurors, male and female students, and racial minority students. Several consistently biased practices and procedures in design juries are identified and statistically examined. The findings presented here have been distilled from one portion of an ongoing comprehensive investigation of the inner workings and educational efficacy of design juries in architectural education. Initial portions of the overall research program were conducted by Mark Frederickson and Marvin Adelson at the University of California, Los Angeles. Investigation of studio education and review processes continues under Frederickson's guidance at the University of Arizona.**

THROUGH THEIR USE OF THE JURY SYSTEM, DESIGN EDUCATORS IN ARCHITECTURE, landscape architecture, interior design, and several studio arts share a fundamental method of evaluating design projects and rendering feedback to students concerning their performance and abilities. The jury is a core element in many of these design curricula and a critical educational vehicle in which students verbally and graphically present their design work to an assembly of design teachers, visiting professionals, and student peers. It is a forum for building and communicating ideas.

Although intrajury communications are often flawed, I believe design juries to be rich in educational potential.<sup>1</sup> After witnessing and participating in design reviews that were quite wonderful in their insight and thoughtful manner of communication, it became apparent to me that these few occasions deserved careful study, especially because most juries appeared rarely to operate at, or even near, their full potential. For the past four years, Marvin Adelson and I have been investigating both the potentials and the defects of jury environments in architectural design curricula. During the conceptual stages of our research, we initiated pilot studies as a means of ethnographically exploring the subject.<sup>2</sup> Early observations indicated that many problems seemed to be linked to interpersonal communications. One portion of this study revealed particularly destructive prejudicial behavior among and between jurors and students of different gender and race—biased conduct that likely discourages many of our most intelligent female and minority students from continuing on in school and the profession.

There have been several interesting studies on studio education and the processes of designing and learning to design,<sup>3</sup> but our initial literature review revealed little formal research on design juries except that of Kathryn Anthony. Her studies of design juries break new ground by refusing to accept the jury as sacrosanct. Although our study focuses much of its effort on the dynamics of intrajury communications, Anthony's comparisons of faculty, student, and practitioner perceptions of the efficacy of the jury were helpful in establishing the need for more research in this area.<sup>4</sup> Whereas Anthony's recommen-

dations focus on developing alternative jury formats, our research concentrates on methods of facilitating interpersonal communications among jury participants. Another researcher in the field of studio education is Chris Argyris. His vignettes of intrajury dialogue in the *Architecture Education Study* began to examine conflicting agendas between jurors and students in design juries.<sup>5</sup> This work supports our observations that flawed communication among participants reduces the jury's educational effectiveness. Sarah Dinham examined the jury as a teaching technique, extending Donald Schön's concept of the 'reflective practitioner' to include 'reflective jurors' as well.<sup>6</sup> Dinham encourages jurors to evaluate constantly the jury process and content in addition to the student work before them. Her suggestions helped direct our thinking toward examination of jury process and content.

Although this research did not address prejudice in juries, it helped establish general directives in our research regarding intrajury communications and participation. To improve understanding of communication in design juries and the prejudicial behavior that we observed in our pilot studies, we built on prior findings in contiguous fields of study, such as small, group behavior, leadership, management, and interpersonal communications. These disciplines contributed to our understanding of gender and racial bias in significant ways.

Research on small-group behavior and intergroup discrimination identifies prejudices and biases that are operant in many task-oriented groups, describing factors that influence group productivity and group relations and that result in inequitable participation rates for different group members. Several studies suggest that female participants in small groups often do not receive a fair hearing.<sup>7</sup> Many of these studies emphasize the importance of leadership as a facilitator of task-oriented group behavior and constructive teamwork toward established goals. They suggest that all participants might benefit from leadership training, and that equitable participation of group members might be encouraged by effective leaders. Leadership is described as a complex concept that cannot be categorized into a collection of personality traits.<sup>8</sup> Of the juries that we observed, 97 percent had identifiable leadership. The jury leader was usually the student presenter's studio teacher. This study focused part of its attention on the process and content of jury leadership. It is a phenomenon that involves relationships that associate the personal characteristics, needs, attitudes, and intentions of the leader, jury members, and student participants with the sociopolitical characteristics and educational philosophies of the school. When these factors change, leadership style and behavior should accommodate. Different situations require different leadership qualities.

Past research on women in leadership positions indicates that in business, politics, and elsewhere, leadership has been and still is largely a male domain.<sup>9</sup> Several studies on gender bias have examined

sex-linked stereotypes, and they describe assumptions of women as passive, emotional, and submissive as self-fulfilling prophecies. Although no behavioral differences are detectable, it is men who often are perceived as independent, active, and leaders by our culture. This makes it increasingly difficult for women to resist the self-fulfilling prophecy fostered by such stereotypical expectations. Research indicates that in task-oriented groups, women do not exhibit such passivity, especially when their recollections and judgments are needed.<sup>10</sup> Women are taking their place, with men, in contributing opinions and information.

Research on male-female interaction in small groups suggests that male group members exhibit subtle forms of resistance to a dominant presence of women and that men directed more task-oriented messages and negative reactions toward women than toward other men.<sup>11</sup> Men also engage in more interaction directed toward the group, whereas women appear to restrict their interactions with men in the group, eliciting more responses from and directing more responses to other women. These findings, among others, assisted us in developing our participation and prejudice variables concerning female juror leadership and verbal participation rates in the jury. They also helped us develop our intergender interruption variables, that is, male-to-female juror and female-to-male juror.

Past studies on racial prejudice examine inequitable participation in groups by various minorities and biased behavior common to task-oriented group process and procedures. Several of these studies focus on the process of stigmatization and discuss the effect of race, physical deformity, and disability on the amount and quality of interaction and assistance received from others.<sup>12</sup> Research indicates that Caucasian participants have a strong tendency to conceal negative racial attitudes. These studies helped explain some juror behavior we observed toward minority students. They also assisted us in developing several racial bias variables, such as verbal participation rates for minority participants in juries and frequency of interruptions of minority participants.

Our post-jury questionnaires suggest that experience with bias in previous juries can cause participants to raise defenses before entering their next juries. Research in interpersonal communications examines the possible negative effects an overly biased or judgmental environment might have on learning and on an individual's openness to new experiences. This body of work defines and discusses the concepts of vulnerability, anxiety, threat, defensiveness, and incongruity in a way that allows us to identify these phenomena in our videotape protocol studies of juries. A large portion of this work is devoted to methods of enhancing communications through more effective listening techniques.<sup>13</sup> Many studies in interpersonal communications are organized around methods of simplifying the working parts of face-

to-face communication. They break down the complexities of talk into easily recognized elements, that is, listening, questioning, reflection, advisement, interruptions, and disclosures.<sup>14</sup> They describe many explicit and implicit ways in which we communicate with one another and help us recognize and anticipate impediments to effective communication. Research suggests specific ways of modifying undesirable behavior and mastering desirable methods of communication.

## Methodology

The overall research project, of which this study on gender bias is one part, employs a multimodal (eclectic) research design, using ethnographic observation and survey data to generate post-factum hypotheses. Methods of observation included (1) videotape protocol studies of 112 juries across three U.S. design schools (these studies indicate that many different variables—interruptions, opinion polarization, idea building, advisement, questioning, jury kinesics and proxemics, sexual and racial bias, verbal participation rates, and so on—can combine to create less than desirable educational results) (see Tables 1 to 8 in Appendix II), (2) a national survey of forty-seven schools of design to assess faculty and administrative opinion concerning the strengths and weaknesses of design juries and any adjustments they may have experimented with in the jury format, (3) post-jury questionnaires of students filmed in our protocol videos that discuss, among other things, the efficacy of the jury as a learning experience (results of this survey suggest that the educational merit of juries can vary considerably, ranging from worthless to exceptionally informative), (4) unstructured interviews of architectural educators and students to assist us in developing an insider's image of their experiences in design juries, including interviews with foreign faculty and students regarding contemporary design review practices abroad, and (5) analytical and historical research regarding past uses and development of design juries and the relationship of the jury system to design education and the studio.

For our initial sites, we chose juries in three different architectural programs, which will be referred to as Schools 1, 2, and 3. School 1 is located in a highly urban setting and prominent external jurors are a common occurrence. It is a graduate program with highly selected research-oriented faculty. The students are also highly selected from urban areas and other countries. At the time of our study this school had nineteen full-time (one minority and four female) and thirteen part-time faculty. School 2 is located in a midsize city and often uses local practitioners as external jurors. It is an undergraduate program. The students are drawn from both rural and urban centers, and there is a moderately demanding selection process for admission



into the professional phase of the curriculum. This school has twenty-one full-time faculty (no minorities and one woman) and eleven part-time faculty. School 3 is located in an isolated rural setting. This program uses local external jurors but has also developed an active VIP guest program. It is an undergraduate program with highly selected faculty. Students, who undergo a rigorous professional-phase selection process, are drawn largely from the surrounding rural environment. This school has eighteen full-time faculty (no minorities and no women).

This multisite procedure was employed to strengthen inferences concerning similarities viewed across all three sites because ethnography is typically weak when results are generalized across diverse populations.<sup>15</sup> The study of design review procedures across many different schools and regional contexts may add significance to our findings. Sampling of the students and jurors within the schools was not random; it was based primarily on the participants' willingness to be filmed. This is a potential area of invalidity, but the ethical issues involved were more important than attempting to develop a truly representative sample. We could not obtain the consent of all faculty and students in all programs. We filmed all levels of the design studio, basic design through graduate-level studios. We also filmed all types of design juries: seventeen preliminary, forty design development, thirty-nine final, and sixteen thesis juries. In each school we viewed as many different combinations of faculty and students as possible, including visiting jurors.

The qualitative analysis of our videotape data indicated that certain prejudicial practices and procedures appeared to be commonplace in the design juries that we observed. We then identified seventeen low-inference descriptor variables that enabled us to measure empirically hypotheses regarding apparently biased behaviors. We organized the variables into the following two categories:

1. Time, participation, and prejudice variables: These variables measure time and verbal participation observed for jurors and student presenters, including the student's initial presentation, the total duration of each jury, the total verbal participation allowed the student in each jury, the number of female jurors per jury, and the number of male jurors per jury. Time, participation, and prejudice variables help describe specific biased and inequitable procedures and practices in design juries.<sup>16</sup> They are described in detail in Appendix I and in Tables 4 and 7 in Appendix II.
2. Content and Process Variables: These variables help describe intrajury communication strategies and procedures employed by the participants to convey and defend their ideas, and they

help measure incidences of collaborative idea building among jurors and student, rhetorical questions, juror interruptions, and juror protectionism. Protectionism occurs when a juror, usually the student's studio teacher, speaks for or through the student to address critical remarks made by other jurors. Content and process variables describe the inner workings and educational efficacy of juries. They can significantly affect the general ambience and educational outcomes of the jury process.<sup>17</sup> They are described in detail in Appendix I and in Tables 5 and 6 in Appendix II.

Research in design education is still in its conceptual stages, often deriving theory from diverse fields of study. Incursion into this broad subject is therefore exploratory in nature and necessarily a bit clumsy. Combined with the experimentally messy nature of human behavior, especially in the emotionally charged arenas of design juries, this suggests that a qualitative, ethnographic inquiry would be appropriate. As the data base grows, so may the opportunities for more experimental research. This inclusive approach to the subject acknowledges that study of this multifaceted subject should be comprehensive to retain the possibility of using analogies and finding correlations among the many different aspects of the topic. Ethnography directed portions of the literature review and generated the following hypotheses regarding gender and racial bias: (1) that female jurors speak less frequently and for a shorter duration than their male colleagues (see Table 1), (2) that female students are interrupted more frequently by jurors than are male students and that juries of female students are of shorter duration than those of male students (see Table 2), (3) that African American students are interrupted more frequently than average and that they receive less substantive feedback from the jurors than do other students (see Table 3).

## Results and Analysis

This section summarizes our findings concerning female and racial minority participation in design juries.

### *Female Juror Participation*

We observed that female jurors receive less than their fair share of total juror commentary and speak for a shorter duration than male jurors. When jury leadership is female, female juror commentary and duration appear to increase. These observations are verifiable through comparison of the mean rates of female and male juror verbal participation and duration (seconds of "talk time") and through comparison

of female verbal participation and duration rates with male jury leadership (see Table 1).

**Analysis:** Our findings demonstrated that female jurors spoke approximately 29 percent less than they “deserved” across all juries studied. They spoke 59 percent less than deserved when jury leadership was male. Among other sociopsychological factors, this imbalance may be attributed to a general atmosphere of male domination. Female jurors speak less and are interrupted more when they are in the minority. Female jurors generally remain verbally withdrawn from the proceedings, especially when they comprise less than half the membership. When they do speak, their comments are shorter in duration, 25 percent less than male jurors’ comments. This may be because their male colleagues interrupt them more often or because they have become conditioned to or intimidated by male-dominated jury environments. Of course, there are spectacular exceptions to these observations, but generally female jurors appear to participate verbally significantly less than their male counterparts. The kinesic behavior of female jurors also appears to be slightly more defensive than that of their male colleagues.<sup>18</sup> We observed that female jurors often tend to cluster their chairs together and locate themselves farther away from the student presenters than do their male colleagues. Unlike male jurors, female juror posture is usually more rigid, and they are less likely to stand, lean toward the student presenter when speaking, or turn and address the student audience.

When the jury leader was female, female verbal participation dramatically increased 350 percent from female verbal participation under male leadership. This may have occurred for several reasons: With female leadership, female jury membership doubles on the average. Our interviews indicate that female leaders are somewhat more active in recruiting female jurors. When male-to-female juror membership ratios approach 1:1, female verbal participation appears to increase as well. Perhaps women feel more confident or willing to express themselves publicly in a less male-dominant environment. Surprisingly, the duration of female juror remarks decreased with female jury leadership. This may have occurred because female leadership was observed only in preliminary juries, and not in the more lengthy thesis juries in which commentary is traditionally more drawn out and intricate. In many schools, thesis juries are considered more prestigious and more academically significant than developmental juries or the juries of nonsenior students. None of the thesis juries observed was led by a woman.

We have observed in interruption-congested juries that though they averaged 60 percent more male than female jurors, male interruptions of female jurors occurred 30 percent more often than male

interruptions of male jurors. In the five juries with equal male-female membership or in the nine juries in which women predominated, these frequencies were reversed. Dominance of one gender in the jury may be associated with discrimination of the minority gender in frequency of interruptions.<sup>19</sup>

Out of fifty-two thesis and preliminary juries and 472 jurors observed at Schools 2 and 3, no female jurors were present (a nonstudent female audience member at School 3 spoke for fourteen seconds during one jury). Our data on female participation was gathered in sixty juries filmed in School 1. Each of these had at least one female juror present (mean attendance was 1.97). School 1 has rigorously recruited both female jurors and faculty members; whereas during our observations, School 2 had one full-time female faculty member, and School 3 had none. (Since our site visits, School 2 has hired one additional female faculty member.) School 2, unlike School 3, has access to female architects and landscape architects in its metropolitan area. Although School 1’s female representation is significantly more equitable with 2:3 female-to-male jury membership ratios, the actual verbal participation of female jurors lags behind that of their male colleagues.

#### *Female Student Participation*

Observations across all three schools suggest that female students receive more interruptions to their presentations than other students and that their juries are briefer than average. Observations were tested by comparing mean interruptions and jury duration of female students with the means for all juries (see Table 2).

**Analysis:** Interruptions to female students’ verbal presentations were 1.4 times more numerous than the average for male students. Total jury time for female students averaged 12 percent less than total jury time for all students ( $\alpha = .05$ ). The interruptions to the female student presentations suggest a condescending attitude toward the design efforts of female students. Less total jury time may therefore reflect this patronizing stance toward female students by the males who dominated the juries, as female students averaged only 30 percent of all juries observed. We have also observed that female students often appear more acquiescent to critical juror remarks, becoming openly defensive less frequently than the males. Female students also receive 30 percent fewer rhetorical questions than males. This may be due in part to their apparent acquiescence to direct criticism.

Across the three schools, female student participation appears mixed. Only two common cross-school trends appeared in our analysis. In all three schools, interruptions to female student presentations were dramatically higher than interruptions to male students in the

same schools (School 1 = 1.20 times more, School 2 = 1.50 times more, and School 3 = 5.35 times more interruptions to female student presentations). All three schools averaged approximately a 30:70 female to male student ratio in the juries observed.

School 3's jury performance with female students appeared consistently biased in our sample; female student presentation time was 0.73 times that of the male student average (5.05 to 6.86 minutes); female total jury time was 0.79 times the male student average; incidence of idea building in female student juries was 0.83 times that for males; female students were asked rhetorical questions 1.20 times more often; total interruptions occurred 1.27 times more often in juries of female students; and as previously mentioned, there were 5.35 times more interruptions to female student presentations. In School 3, incidence of protectionism was 0.53 times less for female students. We did not observe overt hostility between jurors and female students, but we did notice a condescending attitude, for example, lower expectations and a coddling sort of atmosphere. The female students at School 3 appeared outwardly docile during their juries. They showed little defensiveness or anger. Portions of this behavior may relate to the fact that School 3 had no female faculty at the time of our study.

The sample size for School 2 was small ( $N=12$ ), although the figures were consistent with our field observations. Unlike School 3, School 2's jury environment appeared at times to be overly nurturing of the students, especially with the women. Female students received 1.10 times more total time in their juries, 1.54 times more real questions, and 0.29 times fewer total interruptions, they were protected by the jurors 0.60 times more frequently, and they received 2.25 times more rhetorical questions than did their male counterparts. School 1 was as consistently disrespectful of male students as of female ones except on two measures: Female students were protected 1.25 times more frequently than male students, and female students were asked 0.65 times fewer rhetorical questions.

#### *Minority Participation*

In 112 juries observed across three schools, we only observed one racial minority jury member. This was a male Hispanic American guest juror who attended a School 2 thesis jury. Student minority representation in our sample appears to reflect many inequities inherent in our society. Hispanic American students were underrepresented in all three schools relative to their local populations. African American students were underrepresented in Schools 2 and 3, but Asian American student representation was significantly higher than their population percentages in all three schools. The minority representation in the juries that we observed closely approximates the schoolwide figures: In School 1, 35 percent of the students we observed were minority members; in School 2, 17 percent; and in School 3, 20 percent. During our study, School 1

had the only racial minority faculty member of all three schools. It has also been most successful at recruiting a more equitable representation of the various minority groups throughout the student body.

#### *African American Student Participation*

Our observations indicate that African American students experience more interruptions to their verbal presentations and more overall interruptions during their juries than the average for all other students. We also observed that they receive less than average amounts of verbal participation time in their juries. These observations are verifiable through simple statistical analysis of the mean incidence of the above three variables (see Table 3).

**Analysis:** African American students were interrupted 2.9 times more than the average for all other students. Interruptions of African American students during their verbal presentations occurred 1.5 times more frequently than the average for all other students. Verbal participation time for African American students was 18 percent less than average for all other students. T-tests on the interruption means rendered these specific findings statistically insignificant ( $p>.05$ ). Although all other mean comparisons for African American students were statistically significant according to our t-tests, the small sample size indicates that further research is needed. Our observations, survey data, interviews, and personal experience as jurors suggest that this is an authentic problem that needs further examination. We are continuing to increase our sample size of minority participants in juries.

Our observations suggest that there is a self-conscious attitude toward certain minority students. It is as if the jury is so conscious of the possibility of discrimination that they walk on eggshells. The jury seems less relaxed, although its commentary is less openly critical of the students' designs. Remarks appear to be couched in a diplomatic genre that renders them condescending and at times insipid. Jurors tend to speak in simplified terms and interrupt the students with gentle prompting. It may therefore be possible that this tense and rather unnatural atmosphere encourages more interruptions, allowing less time for students to participate in the proceedings.

#### **Recommendations**

Encouraging dialogue, motivation, and trust with students is crucial in the success of the studio and the juries. Unlike the studio, juries compress an enormous range of information and emotion into a twenty- or thirty-minute ordeal, allowing little time to develop trusting relationships. In such critical moments, it is important that jurors and educators possess a repertoire of well-established communication,



leadership, and idea-building skills, as well as knowledge of the effects of their personality and style on others.<sup>20</sup> Instruction in these skills should be part of an educator's graduate education or professional updating. We recommend that graduate schools in the design professions try devoting portions of their curricula to teacher training. This instruction might be available to both active and prospective design educators and administrators and might include seminars and course work in four areas: leadership, interpersonal communications, educational goals, and research skills. The newly developed interdisciplinary PhD program in Design and Planning Research at the University of Arizona will include just such a program for prospective design educators.

We are developing a detailed report on methods of facilitating the jury process. It is based on the findings of our overall study on design juries and discusses the development of a graduate teacher-training program in more depth.<sup>21</sup> This section outlines recommendations relevant to bias in design juries.

#### *Leadership*

Research in group behavior and management shows that effective leadership enhances productivity in task-oriented groups.<sup>22</sup> Our observations indicate this to be the case for design juries as well. Group facilitation training should be part of the training of design educators. Jury leaders would be expected to help set style, content, and purpose and to ensure more productive outcomes through the promotion of constructive juror and student behavior. Leaders should focus on the jury process, continually clarify juror and student remarks, and dispel ambiguity in the dialogue. They need to recognize defensive attitudes and encourage equitable participation. In one six-hour segment in our record, the jurors consistently interrupted the student presentations after an average of only two and one-half minutes. In another twenty-five-minute jury for a minority student, we recorded more than sixty intrajury interruptions, that is, juror-to-student, juror-to-juror, and student-to-juror. These interruptions divert the jury and create animosity and rivalry for the floor.

Leadership also can be viewed as a collective phenomenon, its efficacy depending on participation from all members in a group.<sup>23</sup> We might surmise, then, that the more members of a jury that are aware of and sensitive to critical leadership issues, the smoother and more efficient the jury. Although there should be a designated leader, the leader's task would be less demanding and could be less authoritarian if all participants were more sensitive and responsive to group dynamics and more practiced in facilitating group process. We believe that gender and racial bias are not always isolated individual behaviors and that schoolwide attitudes and neglect can promote or discourage prejudicial behavior. Minority groups in two schools of our study have experienced tensions with specific studio teachers (in one school

an African American group and in the other a group of female students). The issues concerned the efficacy of and possible racial and gender bias in methods of design education. Although the faculty and administration have met with these students in an attempt to improve the problems, inattentive and inactive administrative leadership failed to anticipate the problems before schoolwide action by the students. Leaders in these two schools were not active in listening and in developing trust among administration, teachers, and students.

Students and faculty can feel alienated from their counterparts and from the goals and organizational intentions of the school. Administrative leaders should learn to identify and empathize with those who have become alienated from the system and to envision and implement a mutually productive fit between them and the organization. Many management training programs address similar bias issues and should become a part of any design educator training effort. Development programs should address the complexities of intraschool politics and the individual's (student and faculty) struggle to understand and adapt his or her personal needs and skills to the organizational intentions of the school.<sup>24</sup> Our study revealed inequitable representation of minority groups as faculty and jurors. Schoolwide leadership should examine these imbalances and develop means of encouraging the participation of minority faculty, jurors, and students in our schools and our profession.

#### *Interpersonal Communications*

Gender and racial bias can encourage defensive postures toward juries. Course work in interpersonal communications should be grounded in mutually respectful approaches that emphasize the importance of listening as well as processing and presenting feedback.<sup>25</sup> Only in the kind of nonthreatening environment that such behavior helps create can students or jurors safely explore, evaluate, and incorporate new experiences into their self-concepts. As defenses fall, the truth becomes increasingly apparent, and opportunities for learning and sharing ideas can be recognized and accepted. If these messages have been sincerely communicated and our natural tendencies to judge and evaluate have been appropriately disciplined and subdued, the entire atmosphere of the jury can alter dramatically. Our observations suggest that prejudicial behavior in juries can be unconscious and habitual. Unfortunately, a potentially productive jury environment can be severely hampered by only one or two careless or thoughtless participants. The need for self-awareness and constructive feedback among our colleagues is therefore urgent.

#### *Methods, Goals, and Accountability*

Juries are a principle educational and evaluative tool for the studio classes that form the core of most design curricula. The strengths and

weaknesses of studios are reflected in student performance in the juries. Because design can be a bewildering experience, the enigmatic quality of the process often provokes intense debate concerning what constitutes good design and good designing. The lack of accountability inherent in this dialogue allows many irresponsible comments to go unchecked or unclarified and many design processes and products to go unexplained, thereby confusing students and making rational discussion difficult. We believe that as studio instruction, the design process, and methods of evaluating design become more explicit, teacher, juror, and student accountability will increase while the incidence of bias may diminish. As educational outcomes and student-teacher performance guidelines become increasingly clear, discussible, and rational, the opportunity for prejudicial behavior and the biased evaluation of the work and ideas of others may be lessened.<sup>26</sup> The opportunity for emotional, unsubstantiated, and irresponsible comments is reduced as the performance expectations of all participants draw nearer to one another.

We recommend that seminars on studio instruction examine more explicit methods of teaching, discussing, and learning design.<sup>27</sup> These seminars should encourage discussion of the organizational and generative power of design-ordering systems, rigorous methods of concept getting and form generation, studio-related criticism and theory exercises, typology studies that also discuss alternative design methodologies, analytical diagramming techniques, presentation strategies, and valuative and generative shape grammars.<sup>28</sup>

Research in verbal communications emphasizes the need for thorough prepresentation strategy development and preparation.<sup>29</sup> Ill-prepared and inexplicit student verbal presentations also cause communications problems that often escalate into juror frustration and a breakdown in intrajury communication. Fewer than 50 percent of the students surveyed felt that they had adequately prepared their verbal presentation and defense. Fewer than 50 percent outlined their presentations before the jury, and fewer than 10 percent practiced their presentation aloud. These statistics provide a dismal image of our schools' attitudes toward nonvisual design communications.

#### *Research Skills*

Design educators have been remiss in self-analysis and self-improvement.<sup>30</sup> Unlike educators in many other professions, we employ teaching methodologies that are little changed since the turn of the century. This reflects an indolent attitude, and one that may be contributing to many of the design professions' current laments. A central factor in this professional passiveness is that we have not been trained in research design and methods. Although Schön speaks at length of the value of the ad hoc research that occurs in the studio experience re-

garding both learning and teaching design, the generalizability of the results of these types of inquiry also should be of interest to the profession.<sup>31</sup> Without some experimental rigor, the results of these studies become very personal and often incontestable pieces of information.

One value of research is its ability to coalesce resources (time, effort, money, minds) around a topic of concern. We believe that the research efforts of Argyris, Dinham, Schön, and Anthony, along with our own, will be helpful in encouraging the recognition of the need for this line of research. National surveys of faculty opinion, structured interviews, surveys of student opinion, protocol studies of juries and the studio, publication of hypotheses and findings—these investigative tools serve to increase professional, faculty, administration, and student awareness of a problem. Bias and prejudice have been formally studied in other fields for years. We might have suspected similar predicaments in design education, but were unable or unwilling to identify, observe, define, and analyze them. We have not been formally trained to examine our own behavior, performance, and professional effectiveness. The realization that others are having similar problems should initiate discussion of which remedies have already been experimented with and which possibilities remain untried. We may have become complacent in our ignorance.

These issues ultimately transcend the jury and the studio, and begin to reflect general attitudes toward diversity and equality in the profession. Thoughtless, egocentric, and biased conduct in juries alienates many bright and eager students, and unfortunately, it also socializes others into this same counterproductive behavior. Disrespect can be learned and carried on into the profession, and we believe that juries can be symptomatic of this misbehavior. The jury is potentially a wonderful educational tool, and it could become a vehicle for realigning our professional attitudes and methods of communication. Shall we promote and maintain conceit and exclusivity, or can we envision and develop an aggressively diverse, collaborative, and just professional body that is more reflective of the changing profile and needs of the society in which we live? I suggest that this sort of fundamental change might begin in juries and in our studios.

#### **Acknowledgments**

I would like to thank the schools that participated in our study. Their willingness to share information and openly address potentially embarrassing issue speaks well of their educational intentions and resolve toward self-improvement. I would also like to thank Dr. Marvin Adelson with the Graduate School of Architecture and Urban Planning at UCLA for his guidance throughout our study on design juries.

## Appendix I

### Summary and Definitions of Variables

The qualitative analysis of our videotape data indicated that certain prejudicial practices and procedures appeared to be commonplace in the design juries that we observed. We then identified seventeen low-inference descriptor variables that enabled us to measure and empirically examine our hypotheses regarding apparently biased behaviors. We have organized the variables into the following two categories:

**Time, Participation, and Prejudice Variables:** The following are measures of time and verbal participation observed for jurors and student presenters. They help describe specific biased procedures and practices in design juries<sup>16</sup> (see Tables 4 and 7 in Appendix II).

**Stime:** The time allowed for each student's initial verbal presentation.

**Tottime:** The total duration of each jury observed, including the student verbal presentation.

**Stalk:** The total verbal participation allowed the student in each jury, including student presentation time. This figure represents the ratio of student speaking time to the total time of the jury.

**Femj:** The number of female jurors per jury.

**Malej:** The number of male jurors per jury.

**Fdeserve:** The ratio of speaking time taken by female jurors to their proportional representation on each jury.

$$Fdeserve = \frac{(\text{seconds of female juror talk} \div \text{seconds of male} + \text{female juror talk})}{(\text{number of female jurors} \div \text{total number of jurors})}$$

**Fdurat:** The average duration of female juror statements in each jury observed, measured in seconds.

**Mdurat:** The average duration of male juror statements in each jury observed, measured in seconds.

**Srace:** The race of the student in each jury observed, for example, Caucasian, Hispanic American, African American, Asian American, Indian American.

**Content and Process Variables:** The following variables help describe intrajury communication strategies and procedures employed by the participants to convey and defend their ideas. They help describe the inner workings and educational efficacy of juries. They can significantly affect the general ambience and educational outcomes of the jury process<sup>17</sup> (see Tables 5 and 6 in Appendix II).

**Ib:** The incidence of collaborative idea building among jurors and the student. In many productive juries, the idea-generating portion of this phenomenon originated from the student's initial design intentions. Ideas were then used as a springboard for more complex concepts, or were used to generate alternative proposals.

**Real:** The incidence of nonrhetorical questioning of the student, with interest displayed in the student's knowledge and thought processes, that is, nonfunctionally oriented questioning of the student, for example, "Please describe your decision priorities relevant to this site development scheme," versus "Why aren't your drawings all oriented to the North?"

**Rhet:** The incidence of rhetorical questions asked of the student by the jurors. The emphasis is placed on juror "telling" disguised as rhetorical questioning.

**Isp:** The number of juror interruptions to the student's initial introductory statements in each jury observed.

**Its:** The number of total juror interruptions of the student in each jury observed.

**Itotal:** The total number of interruptions that occur in each jury observed, that is, student-to-juror, juror-to-student, and juror-to-juror.

**Protect:** The incidence of juror "protectionism" per jury. Protectionism occurs when a juror, usually the student's studio teacher, speaks for or through the student to address critical remarks made by other jurors.

**Note:** Due to the variation in types of jury taped at each school, all of these variables have been translated into "value per minute" except *Stalk* which is a percentage per jury value.

## Appendix II

**Table I** Verbal Participation of Female and Male Jurors (Mean Values)

	Duration of Female Juror Comments (Fdurat)	Duration of Male Juror Comments (Mdurat)	Female Juror Verbal Participation (Fdeserve)
All Juries (N=112)	29.10 (p<.05)	38.50 (p<.05)	.290 (p<.05)
Male led (N=70)	37.95 (p<.05)	39.21 (p<.05)	.589 (p<.05)
Female led (N=42)	25.10 (p<.05)	37.30 (p<.05)	.160 (p<.05)

**Table 2** Verbal Participation and Interruptions of Female and Male Students

	Interruptions to Student Introduction (Isp)	Total Duration of Each Jury (Tottime)
All Students (N=112)	0.61 (p<.05)	19.60
Female (N=34)	0.76 (p<.05)	17.50 (p<.05)
Male (N=78)	0.54 (p<.05)	20.61 (p<.05)

**Table 3** Verbal Participation and Interruptions of African American Students (Mean Values)

	<i>Student Verbal Participation (Stalk)</i>	<i>Total Interruptions of Student (Isp)</i>	<i>Interruptions to Student (Its)</i>
African American (N=007)	0.86 ( $p > .05$ / $H_0$ accepted)	4.14 ( $p < .05$ )	.423 ( $p < .05$ )
All Others (N=105)	0.59 ( $p > .05$ / $H_0$ accepted)	1.45 ( $p < .05$ )	.507 ( $p < .05$ )

**Table 4** Time and Participation Variables

	<i>Mean</i>	<i>School 1</i>	<i>School 2</i>	<i>School 3</i>
Student's Initial Presentation Time (Stime)	5.8 min.	4.8	9.2	6.4
Total Duration of Each Jury (Tottime)	19.6 min.	15.9	32.1	21.6
Ratio of Preceding Two Variables (Stime/tottime)	.297	.300	.290	.290
Total Student Verbal Participation (Stalk)	.500	.460	.460	.570
Total No. of Jurors per Jury (Femj+Malej)	7.0 jurors	5.2	5.5	10.2

**Table 5** Content Variables

	<i>Mean</i>	<i>School 1</i>	<i>School 2</i>	<i>School 3</i>
Collaborative Idea Building per Min. (Ib)	.14	.08	.10	.25
Nonrhetorical Questions per Min. (Real)	.19	.10	.14	.32
Rhetorical Questions per Min. (Rhet)	.05	.08	.02	.03

**Table 6** Process Variables

	<i>Mean</i>	<i>School 1</i>	<i>School 2</i>	<i>School 3</i>
Interruptions to Student Introduction per Min. (Isp)	.03	.06	.007	.003
Total Interruptions of Student per Min. (Its)	.08	.15	.04	.02
Total Interruptions per Min. (Itotal)	.17	.31	.11	.05
Protectionism per Min. (Protect)	.04	.04	.06	.02

**Table 7** Gender Participation and Prejudice Variables

	<i>Mean</i>	<i>School 1</i>	<i>School 2</i>	<i>School 3</i>
Female Jurors per Jury (Femj)	1.07	1.97	.00	.00
Male Jurors per Jury (Malej)	5.90	3.20	5.50	10.20
Female Jury Leadership (Femlead)	.375	.70	.00	.00
Female Juror Verbal Participation per Jury (Fdeserve)	-.294/jury	-.285	.00	-.021
Duration Male Juror Comments (Mdurat)	38.49 sec.	44.33	48.17	.725
Duration Female Juror Comments (Fdurat)	29.11 sec.	29.51	.00	.12

**Table 8** Cross-School Data on Female Students (Femst) in the study

	<i>Mean</i>	<i>School 1</i>	<i>School 2</i>	<i>School 3</i>
Percentage of Female Students per School (% female)	.304	.333	.250	.275
Student's Initial Presentation Time (Stime)	5.8 min.	5.0	9.0	5.0
Total Duration of Each Jury (Tottime)	19.6 min.	14.6	34.0	18.2
Collaborative Idea-Building per Min. (Ib)	.15	.08	.10	.22
Nonrhetorical Questions per Min. (Real)	.19	.09	.19	.35
Rhetorical Questions per Min. (Rhet)	.05	.05	.03	.04
Interruptions to Student Introduction per School (Isp)	.06	.10	.00	.03
Total Interruptions per Min. (Itotal)	.20/school	.22	.17	.17
Protectionism per Min. (Protect)	.01/school	.01	.00	.00

**Table 9** Cross-School Data on Minority Groups (Srace) in the Study

	Mean	School 1	School 2	School 3
Caucasian	.73/school	.67	.83	.80
African American	.06/school	.10	.00	.03
Asian American	.20/school	.22	.17	.17
Hispanic American	.01/school	.01	.00	.00

## Notes

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# Design Juries: A Study in Lines of Communication

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*This study assesses impediments to lines of communication recurrently found to be operational in design juries, i.e. student to juror, juror to student, juror to juror. Unfortunately, discourse within design juries can be easily blocked or distorted, and can become one-sided and one-way in nature. The following is a brief description of elements in this dialogue that can and often do go awry.*

**Keywords:** design education, group behavior, creativity, learning, studio instruction, group leadership.

## Introduction

Most design educators have experienced a number of very different jury environments, often highly charged emotional experiences for both student and juror. They often provide a hearing for new ideas, and offer a process for generating alternative approaches to the design problem(s) being discussed. They can encourage the student and the juror to explore and discuss new philosophical approaches to design and criticism together, and of course they provide a forum for the presentation of design projects. The jury gathers data (listens to the presentation and reviews the drawings and models), synthesizes this information and then offers evaluative feedback to

the student. Juries can also provide lessons for the student in the realities of "due dates", in scheduling work efforts, and in the need for the development of clear concise verbal and graphic presentation skills. They represent an attempt to simulate the real world demands placed upon the practicing professional architect, landscape architect, urban designer, or interior designer.

Unfortunately juries do not always go as planned; things can go wrong and the environment can quickly become unproductive and even hostile and destructive. Research in group behavior, as well as our own protocol data on juries, indicates that design juries rarely operate at, or even near, their full potential for the efficient and enlightened education of students.<sup>1</sup> These findings also concur with H.J. Anthony's pioneering research concerning the perceived effectiveness of design juries by both jurors and students.<sup>2</sup> Our own survey data, while in general agreement with Anthony's findings, also indicates a prevalent belief among architectural educators that the fundamental concept of 'the jury' as an effective vehicle for design education is valid although flawed. Our research has therefore proceeded under the assumption that design juries, despite certain known imperfections, will continue to be integral components of a wide majority of design school curriculums in the foreseeable future, and hence merit our attention.

Our current research on design juries is arranged into three basic areas of study: the first asks about the sort of elements in a jury's lines of communication can go amiss, what are the ramifications of these problems, and why they occur.

A second area of interest evaluates possible remedies to intra-jury communication obstruction, and also explores methods of facilitating communication among jurors and students.

The third topic of interest to our research discusses possible fundamental revision to existing methods of design education and provides suggestions for further research and development in related areas of study. This article addresses the first of the three areas.

Our basic approach to this type of research involves several different methods of data

collection and analysis. Included among these is an essentially ethnographic analysis of video-tape films of juries in several different schools of design (including both architecture and landscape architecture programs), which were also filmed in a variety of different jury situations (schematic, design development, final, first year, fifth year, etc.).

Pre and post jury interviews of many of those same jurors and students filmed are also currently being administered. We are currently surveying design faculty in a number of U.S. schools of design with questionnaires concerning their experiences with, and points of view on, the efficacy of design juries as an educational tool.

## Student to Juror Communication

The studio environment provides the student with the opportunity to experiment with new design philosophies and procedural approaches to design. The jury should offer a forum in which to express these sometimes rather unfamiliar verbal descriptions of design procedures and form generators. The jury can in many ways simulate the professional world by preparing the student to both explain and defend the relevant design ideas to an interested audience, and to also accept and adapt meaningful comments into a stronger overall project. Unfortunately "student to jury" lines of communication are easily blocked or distorted, and can become one-sided/one-way in nature. Below is a brief description of elements in this dialogue that can and often do go wrong.

## Defensiveness and Hostility

It is an arduous task set before the student to verbalize clearly and concisely one to eight weeks of three-dimensional thought into a ten to twenty minute presentation, and yet more difficult to then defend this same project to an audience of practiced and highly skilled professionals. This experience can be especially demanding when the jury environment is perceived by the student to be hostile and critical in nature. Many students operate under the assumption that, "I have ten minutes to talk while the jury looks for something to criticize, and then the jury has twenty minutes in which to score points; during which time it is usually safer for me to acquiesce and remain silent."

The student often enters this situation tired and certainly a bit nervous after days of intense work in the development of the design and its graphic presentation. Typically the student has been concentrating on the two and three dimensional aspects of the design and giving little thought to the verbal presentation and subsequent defense of the project. Frequently the only verbalizing the student has undertaken occurs in diagrammatic or shorthand discussion of certain design elements during prior desk critiques with the design teacher. In these situations both parties are quite familiar with the project and little comprehensive verbal delineation is needed.<sup>3</sup>

Quite naturally the student will often be feeling a bit unfamiliar and uncomfortable with these relatively new design concepts or philosophies. As the presentation proceeds, confidence may ebb, and therefore the student becomes somewhat anxious and potentially defensive, yet struggling for the means to verbally explain and defend the conceptual origins, purpose, and developmental history of the design.

The tendency here can be for the student to play it safe and concentrate the presentation on mundane details already explicit in the drawings, to repeat points nervously, to spend time on matters irrelevant to the purpose of the design exercise and the jury's purpose (agenda). The student might nervously block out previously planned remarks, cutting explanations short, finally sitting back feeling foolish, and listening to subsequent comments and questions that might have been easily explained had the introductory statements been more successfully presented. Consequently, the pace of the presentation usually slows, the student's tone of voice loses its assurance and becomes almost apologetic, and a very unproductive and awkward situation can follow. It is a precarious situation in that the jury may become bored, inattentive or impatient to speak, interruptions may begin, and the audience is essentially lost, with the presentation sidetracked or prematurely cut short by jury comments and/or leading of the student.

The student can certainly sense these problems converging head on, which leads to an increasingly anxious, defensive, and potentially hostile attitude toward the jury. At this point communication is on its way out the

door; one-way dialogue ensues, and learning and listening become very difficult as hostility and defensiveness have replaced rationality and receptivity.

A common post-jury remark by students reflects this situation well: "They did not really listen or understand me".<sup>4</sup> What a sad commentary on any jury, whether the remark is true or false. Of course several different factors can contribute to this type of circumstance:

- the student was ill-prepared and therefore unaware of which elements should be discussed, what the jury needed to hear, what the jury wanted to hear.
- the jury was impatient and rather than listening, concentrated on what they would say; they were 'out hunting' for weaknesses in the drawings during the student's introduction.
- the student never fully developed nor understood the design and therefore could not clearly explain it to others.
- both parties were unaware of one another's needs/desires.

What does the student need in this situation? 1) A fair opportunity to express ideas. 2) A way to safely express doubts about the design. 3) A safe way of soliciting assistance, along with the assurance that the jury is there to educate and offer options and not to necessarily challenge or destroy the student's self-image. 4) Honest, constructive commentary. 5) A sense that the process was well run and fair. 6) A proper grade.

The third item listed really speaks of an individual's 'fear of change', a very powerful and protective emotional defense, one which is obviously intensified in critical environments such as many juries offer.<sup>5</sup> These fears can cause the student to become defensive when faced with an overtly judgmental jury. In many instances, design requires that measures of the designer's personality be displayed throughout, and that the designer (student) then be asked to defend this personal display of values and attitudes in front of what is perceived as a disparaging board of reviewers. When the design is critically judged in an insensitive manner, the student can not help but feel under attack as a person, his or her self-image is also being directly challenged as the jury is surreptitiously asking for a personality change to fit the jury's points of

view. The jury has powerful leverage over the student that is manifest in the form of grades and more importantly, in the approval or disapproval of the student's design efforts. And, what is more, these judgments are most often passed in front of a group of the student's peers, who are also perceived as potential judges of the student's 'worth,' and therefore another indirect challenge to self-image.<sup>6</sup>

Once again, situations such as this can increase defensiveness and hostility, and reduce the student's general receptivity to learning. The student might overreact to comments perceived as criticism, or may feign indifference toward the jury's opinions and therefore antagonize the jury as well. The circular dynamics of this process can be devastating to an environment ostensibly conducive to creative thought and the sharing of information.

### Listening

The preceding situation naturally leads to a discussion of students' listening skills in jury environments. An anxious and fatigued student, with defenses up, is not in an optimum frame of mind to listen sensitively to the comments of others.<sup>6</sup> Often the defenses are raised days before the juries actually occur. One prior unsatisfactory experience or the observation of one especially critical jury prejudices the attitude of the student prior to the actual jury itself. Architectural education does not typically concern itself directly with the development of student listening skills. These skills are assumed to just 'be there' when the appropriate time arises. They are not perceived as professionally relevant skills that can be learned or enhanced. The curriculum often emphasizes individuality to the extreme, with only token amounts of teamwork required in design.<sup>8</sup> There is also little use of clients in the design process, whereby students might hone their listening skills. These attitudes toward teamwork and listening certainly do not approximate the real professional world's demands of the Architect. It is difficult to imagine any building, from residential to very complex scales, that was not in some way the product of team thinking.<sup>9</sup>

### Observer/Actor Perceptions

Another issue that merits discussion here is the phenomenon of student 'excuses,' as they are

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most often perceived by the faculty or jury. Jones and Nisbett have undertaken interesting research into the wide gap which commonly occurs between the opinions of 'actors' (students) and 'observers' (teachers).<sup>10</sup> The student will often speak of environmental obstacles as reasons for a poor performance, i.e. "I had other homework", "I was too tired to concentrate", etc. The teacher, on the other hand, even though apparently outwardly sympathetic, will most often attribute the student's poor performance to either lack of ability, laziness or perhaps to neurotic ineptitude. Faculty tend to believe that students look for excuses or seek to blame others for personal problems.

The research findings of Jones and Nisbett demonstrate that other powerful cognitive factors may be operative in this situation as well. Although a detailed explanation of their findings is beyond the scope of this paper, they did conclude that, "Actors tend to attribute the causes of their behavior to stimuli inherent in the situation, while observers tend to attribute behavior to stable dispositions of the actor. This is due in part to the actor's more detailed knowledge of his circumstances, history, motives, and experiences. Perhaps more importantly, the tendency is a result of differential salience of the information available to both the actor and observer....The observer often errs by over attributing dispositions, including the broadest kind of dispositions - personality traits. The evidence for personality traits as commonly conceived is sparse. The widespread belief in their existence appears to be due to the observer's failure to realize that the samples of behaviors that s/he sees are not random, as well as to the observer's tendency to see behavior as a manifestation of the actor rather than a response to situational cues."<sup>11</sup> Here again, the information exists between the two parties but is perceived in fundamentally different ways. Would better listening skills for both parties, not help alleviate this problem?

### Juror to Student Communication

Potentially the juror to student lines of communication are some of the most productive in the entire jury process. They can carry indicators, insinuation, advice, approval, concerns, motivation, attributional feedback, as well as a myriad of design ideas and alternative

approaches to the challenges at hand. To educate and to learn certainly require that these lines of communication should be two-way in nature. Therefore the jurors need to demonstrate sensitive, well-developed listening skills, as well as manifest the ability to express themselves verbally in the communication of three-dimensional ideas and concepts.

In my experience unfortunately this is not always the case. Listening is an underdeveloped skill in architectural education, as it is in many other forms of education as well. We often emphasize individuality at the expense of team-work, and isolate design problems and their programs from any social context that demands sensitive listening skills. We most often train our students to 'speak' graphically, ("let the drawings do your talking"), and we often disregard the need for our students to have real dialogue with clients concerning the client's needs, aspirations, aversions, anxieties, etc. These attitudes are quite naturally carried into the profession and in turn, back into the faculties of our schools of architecture. It is an arrogant deficiency, and one that should be examined with change in mind.

### Juror Self-discipline

Students often struggle with the verbalization of new concepts, (ideas likely to be quite familiar to their audience of jurors). At this very moment when the jury can become bored and easily diverted from the task at hand, the student most needs their indulgence and attentiveness. The student may be a bit fearful of expressing points of view, especially when these views might run contrary to some juror's known philosophical learnings, but hidden within these sometimes hesitant presentations can be numerous messages and cues about the real meaning of the design and real concerns of the student. The juror must therefore listen with skill and sensitivity. Unfortunately jurors often become inattentive, and bow to the pressure of 'finding something to say', or to their habitual search for 'errors.' I have known a number of jurors who openly admit to the use of review procedures that essentially ignore the student's opening statements. As the student is speaking, the juror's eyes are roving the drawings and models fault-finding. Carl Rogers has written at length

about these problems, and suggests that fault-finding is an almost instinctive approach to communication. We often judge and evaluate long before we have given a fair hearing to what the problem and its accompanying issues really are all about.<sup>12</sup> Many jurors will almost immediately raise a fifty percent audio screen to the student's explanation while looking for something to evaluate negatively (inconsistencies, contradictions, errors), rather than trying to understand and build upon the original intentions of the student and the design. As mentioned before, students sense this and quite naturally become defensive and hostile at this show of disrespect.

One final point concerning juror to student communication that will be discussed in more detail later, occurs when jurors debate or harangue one another through the student currently presenting. Many times the comments are only peripherally relevant to the student's design, and therefore become a potentially confusing tangle of criticism. If the student's design teacher is not present or the jury does not 'protect' the student in these situations the whole point of the jury as an educational agent disappears, with the student further alienated from the process.

### Juror to Juror Communication

As previously suggested, jurors frequently attend juries armed with hidden agendas. The jury can be seen by some jurors as a potential forum in which to propound a certain philosophical approach to design, or to respond to previous statements made by other jurors at other times. Other relatively common misuses of the jury format occur when attempts to discourage divergent opinion within the jury itself are made. Flattery and showing-off to attending high administration figures or prominent visiting jurors is another artifice that often will set aside educational goals, and divert the jury from one of its primary purposes - to serve and educate the student.

### Defensiveness/Hostility

Old and unresolved hostilities among jurors can distort the meaning of certain comments, and arguments can occur without a harsh word ever being spoken. Unfortunately the student is often listed among the casualties of

these 'quiet little wars'. The offending juror will be seen as speaking to the other jurors through the student, or as unduly criticizing another critic's students because their work reflects the unappreciated elements of said critic's design attitudes. I have witnessed on numerous occasions a student being harshly criticized due to a 'turn about is fair play' attitude which is reflected in the following statement: "In yesterday's juries you were unfair to my students, so today ...." These premeditated agendas serve to block communication; the juror with a pre-planned response listens neither to the student nor to subsequent juror remarks. The result is obvious in the amount of energy diverted from the tasks at hand: to educate, learn, share, debate, listen, and respect. It is a selfish indulgence on the juror's part and a wasteful misuse of the jury's energy and expertise.

What do jurors want or need from the jury experience?:

- nourishment from the event in the form of recognition, and respect from both students and peers, (a good grade).
  - a fair hearing for their ideas and attitudes
  - an opportunity to educate.
  - an opportunity to learn and expand their own thinking on design and education - to grow and to change.
- These goals are, in most ways, compatible with those of the students.

### Rivalry

Perhaps intra-jury rivalries coupled with the need for personal recognition cause some of the most severe problems in the juror to juror line of communication. By not listening sensitively to fellow jurors while 'out' searching for design weaknesses, and by responding to the subtle competitive urge often felt among jurors to be the first to uncover and draw attention to 'profound design deficiencies', the offending juror drains the discipline and cooperative energies of the jury. By not cooperating and building upon one another's remarks and ideas, the cumulative effect of the jury can be summarized as a series of incoherent and rather negative criticisms passed on to a distracted, and threatened student. The concept suggested here is not only to allow a fair hearing for all juror ideas, but to also build on each idea momentarily to see its potential for

development more clearly. The student will eventually be presented with a series of delineated ideas which may or may not be chosen for further exploration. This is therefore not a call for jury consensus, in fact it is a warning against striving for consensus. Perfect accord is not needed by the jury nor by the student, and is probably non-productive in the long run. Allow diversity of opinion to exist, learn from these differences. This in itself is an effective demonstration of respect for one's peers and students.<sup>13</sup>

The need to convert others to our way of thinking seems almost instinctual at times, and it can be very difficult to evaluate projects developed in a manner, philosophy, or style not of our persuasion. Alteration of this behavior is difficult and time-consuming but certainly quite possible, and without a doubt it is the responsibility of every design educator.

### Boredom

Boredom can also affect 'juror to juror' dynamics as well as 'student to juror' communication. Not so surprisingly, it is quite possible for jurors to bore both colleagues and students. When the discipline required to listen carefully to the remarks of fellow jurors wanes, repetition of antecedent comments or discussion of tedious issues irrelevant to the current discussion can occur, diverting and depleting the energy of the jury.

It is also relatively easy to forget that juries are an opportunity for educating a much larger audience than just the student presenting. In many traditional jury formats the largely unseen uninvolved student audience goes unacknowledged. We are missing the opportunity to directly involve them in the jury process. Since the logistics of their verbal participation in the jury might be questionable, would it not be possible for them to be required to demonstrate graphically a fundamental understanding of each project and to submit written evaluations of every project in post-jury discussions?

### Listening

As in earlier discussion, one of the key issues in 'juror to juror' communication seems to involve listening to one another and to the student. Attorneys listen for weaknesses, con-

traditions, inconsistencies and errors; should this be our exclusive purpose as jurors as well? Jurors are not merely data gathering, but should also be listening for cues to the authentic feelings and attitudes of the students, and of the other jurors as well. Half of the battle is to understand what exactly is being communicated, and the other half is concerned with convincing the speaker that it is acceptable to explore and make mistakes, without loss of respect. Avoiding interruptions is essential.

Along similar lines, Synectics research has also demonstrated that the comments of female members in male dominated groups regularly do not receive the attention they deserve. It is my experience that this is frequently the case in design juries as well.<sup>14</sup>

### Leadership

The preceding naturally leads into a discussion of the need for effective leadership in juries. Twenty years of research in group dynamics has led the Synectics group in Cambridge to stress the role of leadership in enhancing the productivity of task oriented groups.<sup>15</sup> To date, our research indicates that similar leadership dilemmas can and often do arise in juries as well. The following is a brief discussion of the various elements of juries that can go awry without effective leadership.

In jury situations the role of leader is often undesignated or assigned by default, and this lack of definition can lead to confusion and competition for the leadership role. Synectics has found that a great deal of energy can be expended in these activities, thereby diverting the group from its intended goals. Synectics has observed that in any meeting without a firmly designated leader two or three individuals tend to vie for the leadership role, with the most forceful usually winning temporary leadership, subject to continuous challenges. This type of behavior obviously discourages sensitive listening, increase interruptions, and generally encourages a disrespectful and selfish atmosphere unless it can be moderated by some intervening constructive force.

The ability to facilitate a jury's movement toward productive goals is a learned skill requiring initial insight into the need for effective listening skills, practice, patience, and then again more practice. Unskilled leaders



can sometimes unwittingly misuse their position to promote their own ideas and agendas with the jury and students, thereby denying other participants a fair hearing for the presentation of their ideas. Often this will occur accompanied by politely masked verbal manipulations of the participants, and of course the motives of these attempts are readily transparent to most parties involved. These manipulations will in turn lead to a reduction in the leader's credibility. These insincerities are most often perceived by the juror as an attempt to win converts and as a challenge to their own ideas and beliefs.<sup>16</sup>

By default, many juries allow various eclectic versions of 'Robert's Rules' to become the leader of the proceedings. As the Syntectics Group has pointed out, these rules of group behavior are designed to keep order and to allow conflicting views to be stated and defended; they are not designed to encourage creative group ideation, and an atmosphere conducive to open and free speculation. Syntectics research has again demonstrated that time after time 'Roberts Rules' pressure the outcome of group achievement toward mediocrity, and that can allow for a leadership which is careless with the ideas and feelings of the other participants. This in turn, can set up a milieu of contagious disrespect where each juror begins to see the proceedings as a contest where if someone wins - someone else loses.<sup>17</sup>

This carelessness with the ideas of others can occur in another way when unformed/undeveloped ideas are immediately dismissed by the jury and the leadership as 'impossible' or 'crazy'. The jury often expects complete and tightly developed ideas which are presented in one clean statement, (this is especially unrealistic in preliminary reviews). The problem is that many good ideas initially arrive in undeveloped form, and therefore do not receive the attention they deserve. More superficial or conventional ideas and concepts then become the jury's focus; ones that are quickly completed, easy to comprehend, and easy to defend.

### Group Think

Juries can develop certain unified group behaviors and attitudes over a period of time

working with one another. Potentially this familiarity can be quite helpful in short-cutting a lot of polite 'getting to know you' type behavior. A familiarity with one another's strengths and attitudes can be quite useful in a jury situation where each juror respects the other's areas of expertise and interest, and can then begin to build upon each other's ideas, and thereby more effectively educate the students.<sup>18</sup>

This 'group attitude' can also cause several problems for the jury and for the students as well, particularly when jurors have worked together over a long period of time. The jury can begin to develop an illusion of unanimity. Through subtle self-censorship they begin to assume that all jurors truly agree with the procedures used, ideas discussed, design approaches taught, curriculum decisions implemented, etc. As described in Irving Janis' *Group Think*, this self-censorship can be quite powerful, with direct pressure being brought to bear upon any examples of 'deviant' thought.<sup>19</sup> Over time, this type of behavior can contribute to the formation of the group illusion of invulnerability and morality. The resulting behavior is one of formulaic thinking and rationalization, a situation quite detrimental to the cultivation of individual or group creative thought and behavior.

These problems occur much less frequently in environments where self-expression is encouraged, where mutual respect among all members allows all ideas a fair hearing, and where sensitive listening and effective leadership are the norm.

Although the preceding analysis of a jury's lines of communication may appear pessimistic in nature, and filled with worst-case scenarios, the resolution of these examples of deleterious behavior involves just a few very basic concepts, with which we are all familiar: respect for others, the ability to listen to and understand the attitudes and feelings of others, and sensitive and effective leadership skills.

As educators, we are often quite hesitant to acknowledge that we are remiss in the application of any of these attributes concerning our students and colleagues. Unfortunately, research from most of the above sources,

including our own, indicates that we most often neglect these principles of common decency when operating in group environments. The power of these skills to produce creative thought and behavior, and to diminish counter-productive habits is profound. There is a tendency to underestimate this material, in that listening and respect are assumed to be 'just common sense'. It is difficult to perceive oneself as disrespectful, or as someone who is consistently careless with the feelings and ideas of others. Unfortunately, both our own research findings and personal teaching experiences over the past fifteen years support the contention that irresponsible behavior can and often is habitual and virtually unconscious, and therefore requires time, patience and devotion to rectify.

### Acknowledgements

I would like to thank Dr. Marvin Adelson with the Graduate School of Architecture and Planning/UCLA for his indispensable contribution to the conception and development of our ongoing research study concerning design juries.

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## Minimizing Urban Sprawl through Open Space Design Strategies

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# Minimizing Urban Sprawl through Open Space Design Strategies: The Case of Tucson, Arizona

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*Abstract: Urban sprawl refers to the change in land use outside an urban center that results in a relatively dispersed form of residential or commercial development and causes the loss of open space, farmland, or wildlife resource. Alternative methods of development, such as “smart growth” techniques and “New Urbanism” principles are being promoted as a set of ideas to mitigate urban sprawl, to encourage sustainable growth and facilitate infill development. The purpose of this paper is to address the problems due to the current urban sprawl in Tucson, Arizona. The paper further analyses a suitable site for redevelopment and offers open space design strategies to maximize the use of the undeveloped open spaces within the existing urban fabric by creating activity centers with sustainable development. The paper will also seek the possibilities of creating a connection within the city that would offer a continuous and perceptible urban environment through redevelopment of potential sites. Through various concept alternative developments, a final proposed master plan for the chosen site is generated by connecting three potential areas redeveloped to accommodate mixed-use functions through alternative modes of transportation, linking Tucson in the East-West direction in an attempt to minimize the current urban sprawl.*

*Keywords: Urban Sprawl, Connectivity, Open Space Design, Alternative Modes of Transportation, Infill Development*

## INTRODUCTION

Urban sprawl as described by Williams (2000) is “the outward spread of commercial, industrial, and residential development into open spaces located on the fringes of urban centers” (Williams 2000, 24). The concepts of *Smart growth* and *New Urbanism* principles are seen as ways of combating urban sprawl and building better communities.

These principles depreciate suburban sprawl while promoting denser urban centers, focusing on mixed land use, pedestrianism, aesthetic and architectural continuity as opposed to growing towards the outskirts of the city; leading to decay of downtown areas. According to the American Planning Association (APA) (2002), “Compact, transit accessible, pedestrian oriented, mixed-use, infill development patterns and land reuse symbolizes the application of the principles of *Smart Growth* and *New Urbanism*.” These solutions include increasing the population density within built areas in the urban fabric by encouraging infill developments that provide opportunity to transform underused urban areas into inviting public realms. Responsive infill gives a place new life, making it more functional, exciting, beautiful and sustainable, while at the same time preserving its character and history, increasing reliance on public transit and other environment-friendly modes such as walking and biking instead of dependence on automobile.

Tucson, Arizona like many other cities has been experiencing urban sprawl for a long time. The current development is growing in such a way that suggests it will not stop until it reaches the outskirts of the city resulting in destruction of open spaces and disconnection from the downtown. The downtown comprising the important civic, cultural, historic functions provides a dynamic physical focus for Tucson's unique ethic, cultural and artistic diversity by creating a vital activity center with important arts facilities, historic buildings, offices, residents, unique restaurants, convention hotels and retail spaces. The disconnection from the vital city center due to lack of activities, pedestrian friendly streets and public transit are making Tucson lose its sense of identity, the rich civic, cultural and historical essence. In order to minimize the sprawl and revitalize connectivity with the city center, Tucson desires for open space design strategies. These include new mixed-use and urban infill sites with compatible new buildings, through selected nodes having the maximum potentiality to grow into vibrant public activity centers accommodating functions that include (retail, office, housing, restaurants, hotels), recreational facilities (parks & waterfront developments), outdoor gathering spaces for both small and large events, pocket parks and courtyards. Encouraging infill and mixed land-use, and introducing a variety of transportation choices (trolley, bicycle and pedestrian-friendly street networks) reduce auto dependency and thus aids in slowing down urban sprawl.

## Methods

This paper will respond to the existing urban sprawl by designating a potential site and proposing a cohesive master plan concept for Tucson focusing three areas within the selected site for re-development that expresses and nurtures Tucson's unique natural landscape, cultural heritage, the rich history and community values with the appropriate functions to interlink the developed areas with mixed use functions and infill developments. There is further a desire to make the connectivity through the Congress Street and the 4<sup>th</sup> Avenue shopping street stronger with the introduction of alternative modes of transportation.

A suitable site comprising the important landmarks of Tucson is selected and view shed analysis, archetype analysis, existing vegetation, solid-void relationships, open space uses and building uses are thoroughly studied.

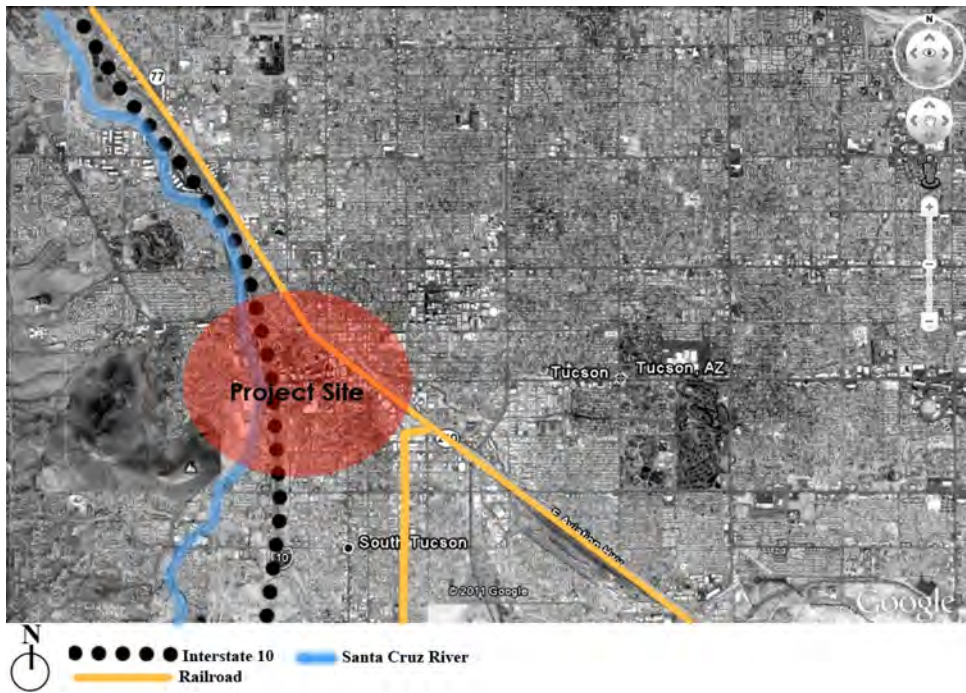


Figure 1: Selected Project Site Showing the Interstate 10, Santa Cruz River and the Railroad

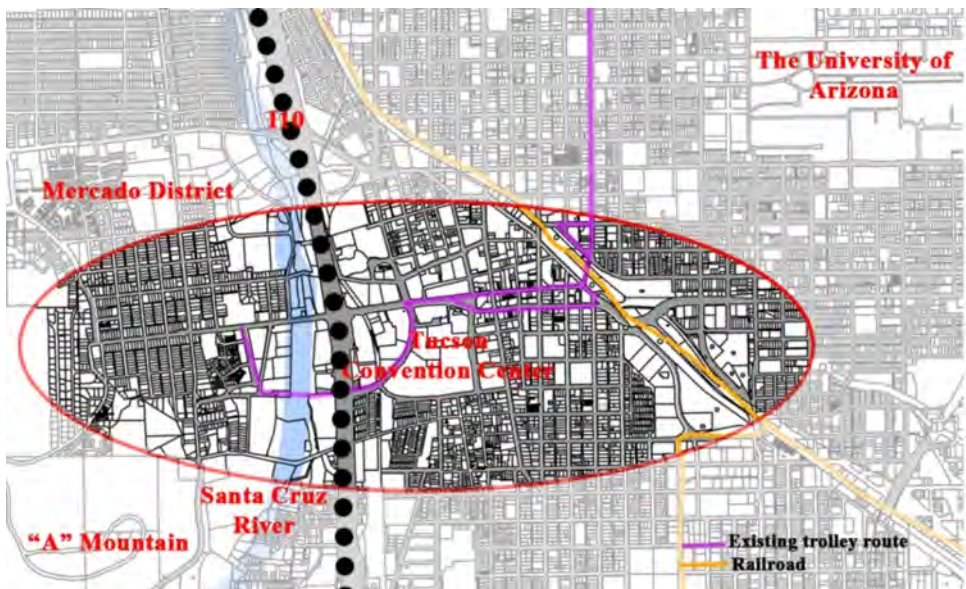


Figure 2: Selected Project site comprising the existing landmarks of Tucson

Figure 1 illustrates the current situation of urban sprawl in Tucson, where the necessity of re-development within the urban fabric to connect the community is vivid. Based on the current



situation of Tucson, there is an extensive need to revitalize the downtown area, promote economic and cultural vitality while implementing the design practices of *New Urbanism* and *Smart growth*; linking the city along the east-west axis to minimize the sprawl further. The chosen site for the new development encompasses the *Downtown area (Central Business District)*, the railroad, 4<sup>th</sup> avenue shopping district on the eastern part of the city; *Interstate-10 and underpass, Santa Cruz River, Mercado district* and the “A” Mountain on the west side of the city connected by West Congress Street. The Santa Cruz River flows from the north of the site and has potentiality to attract public from all over the city, thus enhancing the connectivity with the community.

Figure 2 shows the existing landmarks within the site and the trolley route that currently runs from the east to the west of Tucson. There is a need to propose a new trolley route that links the new designed activity areas to maximize public uses and facilitate public movement with an increased non-motorized use and pedestrianisation. The land use analysis for the chosen site recommends three areas of focus referred as *nodes of influence* ideally suited to be re-developed and transformed into vibrant activity centers accommodating mixed land use like retail, commercial, residential and infill developments with entertainment hubs for civic life.

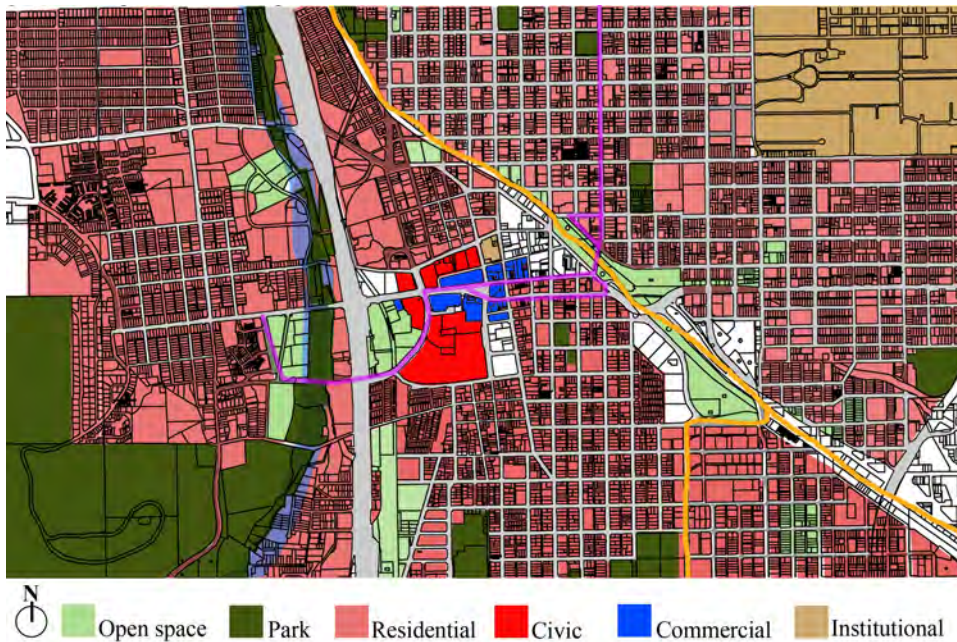


Figure 3: Project Site with the Land-use Analysis, Open Space Uses and Building Uses

The above diagram shows the land-use analysis, open space uses and building uses for the chosen site. There is a substantial amount of open space in relation to the built environment. The existing open space and park areas illustrate potentiality for new developments and the diagram addresses the possible connections between the existing open spaces in relation to one another and to the existing building uses. The low-rise residential areas with little pocket parks or open space demand for more mixed-use facilities with activity centers for the users throughout the city. The existing trolley currently runs from the University of Arizona, 4<sup>th</sup> avenue shopping district, Tucson Convention center and through the underpass to the west of the city. The existing route opens up possibilities to propose a new trolley route that connects the east

and west of Tucson, promoting walkability and mass transportation to create a continuous and cohesive circulation pattern throughout the city, making it livable.

## Results & Discussion

**Table 1: Showing the Three Nodes of Influence and why they are Chosen for Further Redevelopment**

Nodes of Influence	Reasons for choosing the selected nodes
1. The node by the railroad and 4 <sup>th</sup> avenue	Due to close proximity to The University of Arizona and the 4 <sup>th</sup> avenue shopping district. This land has potential to grow into mixed-use developments with designed green areas to attract users.
2. Tucson Convention Center area and its adjacent land	Tucson Convention center acts as the central attraction for the city with existing recreational facilities, designed landscaped area. The adjacent land has bland parking lots and unused open spaces having opportunities to be developed into infill developments and mixed use activity centers. This land in turn connects the west through the underpass and the Interstate 10.
3. West bank of Santa Cruz River and Interstate 10 Underpass.	The existing open spaces by the Santa Cruz River provide opportunities to be developed into linear parks and recreational facilities; underpass currently dividing the city could be redesigned to connect the east and west developments.

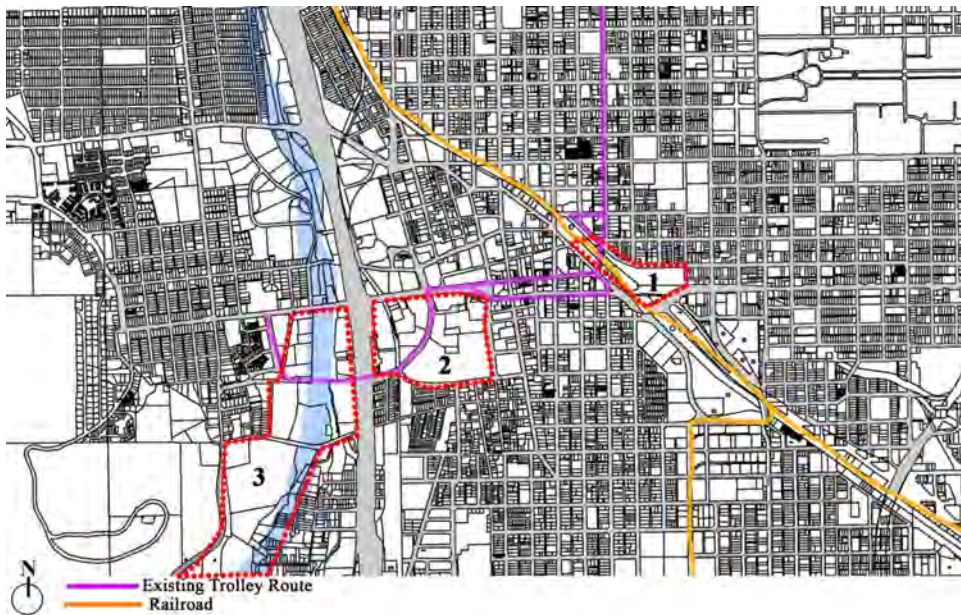


Figure 4: Identifying the Three Areas of Focus Considered as the Nodes of Influence for Redevelopment

Table 1 further illustrates the selection of three areas of focus termed as the *nodes of influence* after analyzing the site due to the potentiality to grow into mixed-use and infill developments. The three nodes are further analyzed with site visits, photographs, interviews, and relevant case study analysis. The nodes hold ample opportunities to accommodate public and recreational facilities, encouraging the use of pedestrian friendly streets, street cars and bicycles. The available open space and parks at each of the nodes are conceptualized to be transformed into linear parks with landscape design strategies that can house large and small public gatherings. As each node is unique in character, every design should respond accordingly. In order to formulate appropriate design responses, each node is then analyzed with a series of relevant case studies, and theory based literature reviews to produce several concept alternatives. The best concepts are then synthesized into one overall master plan concept for Tucson. Finally the incorporation of alternative modes of transportation (pedestrian friendly streets, trolley systems and bicycle paths) links the redeveloped nodes, promote economic and cultural vitality while implementing the design practices of *New Urbanism* and *Smart growth* in an east-west axis to minimize further sprawl.

### **First Node of Influence**

#### **The Node by the Railroad & 4<sup>th</sup> Avenue**

The close proximity to the 4<sup>th</sup> avenue shopping district, the University of Arizona, the railroad and the existing neighborhood make the railroad node a suitable place for new development and a hub for responsive activity center. This piece of land comprising an existing garden with Tucson's native drought tolerant plants opens up possibilities for outdoor activity spaces and green courtyards for social interactions. Urban design elements and practical amenities like seating walls, waste receptacles, food vendors, community oriented public art give the designed space a sense of vibrancy inviting people to spend a quality time and relax from the daily life stress.



Figure 5 (a): Proposed Plan for the Railroad Node of Influence

As shown in Figure 5 (a) the proposed design for the railroad node includes new mixed-uses; retail, restaurants, and higher density (i.e., two to three stories) married student housing and ample green space for social gatherings and outdoor activities. The accessibility from the east and north entrances through pedestrian friendly streets and bicycle paths facilitate easy movement to the designed node. Outdoor activity spaces with shading devices and cooling towers, interconnected pathways, linear green parks by the railroad, views of the Catalina, Tucson Mountains on the north and east, and downtown buildings add a sustainable environmental quality to the node attracting visitors from all parts of the city. The use of turf grass and pervious materials for paving make the node more appealing to people and an excellent zone for public gathering with mixed-use and infill developments.





Figure 5 (b): 4<sup>th</sup> Avenue Street

Figure 5 (c): Table Games at the Outdoor Tables Fair

The above figures highlight the possible activities that make the node more attractive and useable to the users. The 4<sup>th</sup> avenue Street fair in Tucson, Arizona can be an excellent example that can accommodate large social gatherings which can continue from the 4<sup>th</sup> avenue to terminate at the node by the railroad having mixed-use functions and public activity spaces. The accessibility from the snake bridge across the street on the south of the site and the bicycle path bring people from south Tucson and thus creating a strong connection within the community. Outdoor activities may include table games that help to bring people together while enjoying the vibrant space.

## **Second Node of Influence**

### **Tucson Convention Center & its Adjacent Land**

The culturally and historically rich essence of the downtown has been accentuated by transforming the Tucson convention center and its adjacent land in to a vibrant public space with infill developments, mixed land use and green urban landscape. The node by the Tucson convention center and its adjacent land comprises new mixed-use developments within the existing infrastructure, including commercial, residential, recreational and public activity areas. The node acts as a connection to the third node by the Santa Cruz River and with the new underpass design, facilitates the pedestrian movement through the activity centers. The introduction of new street car/trolley route through the designed area allows maximum public activities making the space vibrant. The use of turf grass and pervious concrete on public plazas illustrate sustainable materials and in turn reduce the heat island effect. The vegetation also acts as a noise barrier from the existing Interstate traffic making a useful space for entertainment and social gatherings. The underdeveloped open spaces and the vacant bland parking lots at the node if designed in to mixed land use will provide economic benefits by raising local tax receipts.



Figure 6 (a): Proposed Design for the T.C.C. Node with the Proposed Trolley Route

- |   |                           |
|---|---------------------------|
| 1 Green courtyard   | 7 Recreational facilities |
| 2 Retail & Restaurant                                     | 8 Existing Built forms    |
| 3 Mixed-use Building (Commercial & Residential)           | 9 Amphitheater            |
| 4 Existing parking  | 10 Trolley stop           |
| 5 Hotel   | 11 Underpasses            |
| 6 Outdoor shaded activity area for large public gathering |                           |

The proposed functions as shown in Figure 6 (a) consist of retail, office, restaurants, hotels, housing, civic plazas, and amphitheaters for holding large and small public events, outdoor activities and live concerts. The functions are made accessible to the users with the introduction of a new trolley route and pedestrian friendly streets. As a relevant case study, the *Pioneer courthouse square* in Portland, Oregon shows considerable similarities that hold public events to encourage social interactions. The introduction of trolley systems into the designed space and pedestrian road networks make the mixed-use developed zones an economically viable area with income generating from sponsorships and special events. Another successful example is the *16<sup>th</sup> street mall* at Denver, Colorado; where by incorporating recreational facilities close to the downtown area and by providing a perfect blend of tree lined pedestrian Friendly Street and the trolley system the site is made more functional and vibrant.





Figure 6 (b): Alternative Modes of Transportation and Figure 6 (c): the Tree Lined Pedestrian Street at the 16<sup>th</sup> Street Mall, Denver, Colorado



Figure 6 (d): Outdoor Movie Theatre at the Pioneer Courthouse Square, Portland, Oregon



Figure 6 (e): Farmer's market at the Pioneer Courthouse Square, Portland, Oregon



Figure 6 (f): Light Rail System at the Pioneer Courthouse Square, Portland, Oregon

The above figures show the proposed activities at the designed area. As the tree lined Pedestrian Street seen at the 16<sup>th</sup> street, South Granada Street in Tucson can be made pedestrian friendly by rerouting the traffic linking the convention center and the adjacent civic plaza that can accommodate large public events. Urban design elements like monuments, water features, seating areas, vegetation used as a noise barrier from the high volume traffic as seen at *Campus Martius Park* at Detroit, Michigan; give the place a sense of vibrancy inviting people to spend a quality time and appreciate the rich culture of Tucson.

### Interstate-10 & Underpass Design

The Interstate-10 underpass that currently divides the city has been transformed in to a well-lit lively activity space comprising functions like artifact shops, display of arts, coffee shops and food vendors. The new design connects the east and west of Tucson with a proposed trolley route, bike path and pedestrian friendly street that facilitate movement through the activity area while enjoying the vibrancy of the space. This new design acts as a bridge and is integrated with the Tucson Convention Center node and the west bank of Santa Cruz River node to allow maximum public uses. Introduction of skylight adds lightness to the designed space and the variety of functions makes it a successful area for social interaction. The native plants of Tucson are arranged along the Interstate-10 to minimize the excessive vehicular noise and the vegetation makes the space more attractive and usable to the public, increasing walkability. The sports

facilities, the adjacent mixed use and infill developments encourage maximum public participation, thereby making the connection through the underpass stronger.



Figure 7: Plan for the Interstate 10 & Underpass Linking the East and West of Tucson

### Third Node of Influence

#### West Bank of Santa Cruz River Node

The west bank of Santa Cruz river node accommodates public plazas with recreational and sports activities, that bridge the disconnection due to the Interstate-10 and acts as an anchor for the city. The green linear park with Tucson's native plants by the river, bike trails, exhibition space, T.C.C expansion area, sports facilities like baseball fields and basketball courts, civic plazas with pervious materials and the famous Santa Cruz River farmers' market provides a remarkable experience. As illustrated in Figure 8, the new developments are linked with a proposed trolley route, pedestrian friendly streets and the turf grass areas for social interaction. As seen at the *Emerald Necklace park system* at Boston, Massachusetts, where the river acts as a linkage that opens up possibilities for bike trails connecting several civic plazas and parks with tree shaded walks, Santa Cruz River is transformed to a space for recreation. Housing, hotels, retail spaces and restaurants add economic viability to the undeveloped open spaces. The new underpass design with public activity spaces and incorporation of skylights, coffee shops, art exhibits, and food vendors makes it a lively place for the pedestrian. The proposed street car route runs through the underpass and connects with the new development of the Santa Cruz River node. The linear green park with Tucson's native trees and shrubs, seating walls, plazas holding functions like farmer's market, social gatherings together create a perfect environment for recreation.





Figure 8 (a): Proposed Design for the West Bank of Santa Cruz River Node



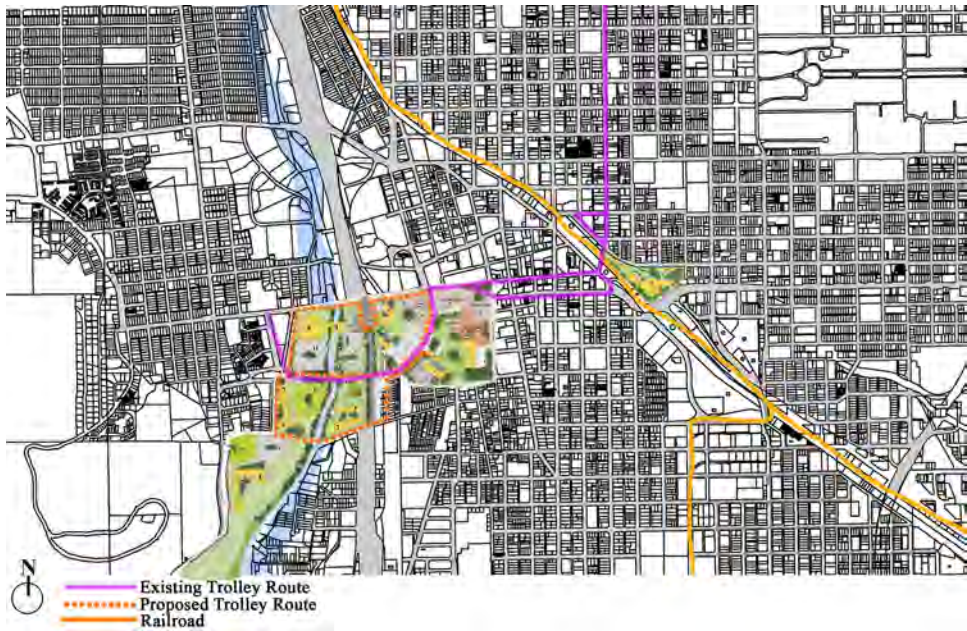
*Figure 8 (b): 4<sup>th</sup> of July Fireworks show by the Santa Cruz River*



*Figure 8 (c): Santa Cruz River Farmers' Market*



The above images show some possible activities at the node, making it a strong anchor for the users travelling from all over the city.



*Figure 9: Final Synthesized Master Plan of the Three Selected Nodes of Influence*

The final master plan design is created after a synthesis of the three selected nodes. This synthesis produced a master plan that adequately responds to the current need to revitalize the connectivity within the city of Tucson, Arizona with redevelopments and a variety of transportation choices. The proposed trolley route in addition to the existing route creates a smooth flow of public through the designed nodes and in turn establishes a strong connection making the community sustainable and livable.

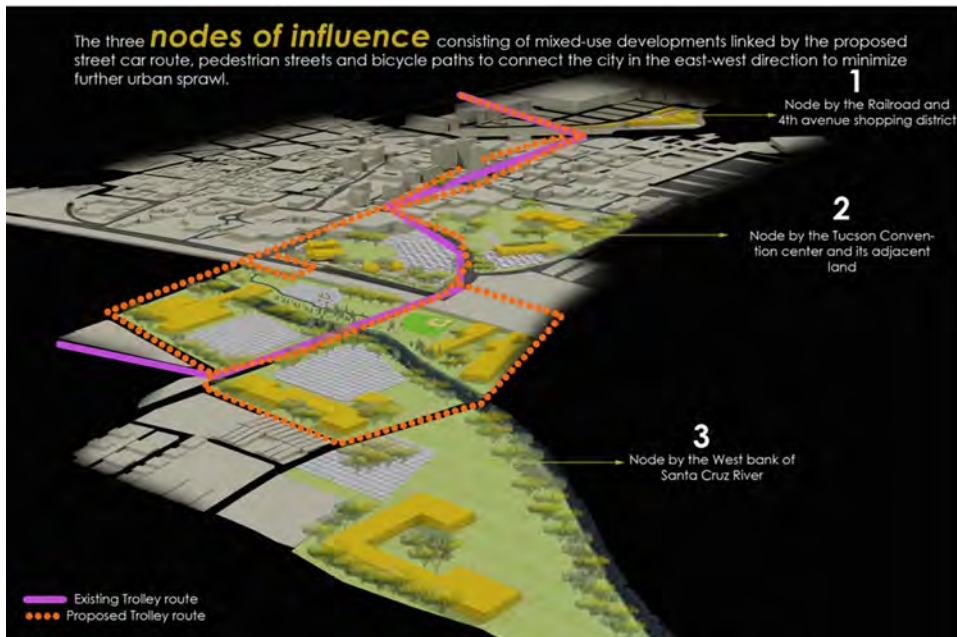


Figure 10: View of the Three Nodes Connected with the Existing and Proposed Trolley Routes

## Conclusion

This paper responded to the existing urban sprawl problems by presenting a master plan concept with three potential sites redeveloped that encourages a broad range of recreational and public uses that utilize the available facilities and infrastructure. An environmental overlay of the various components of the master plan design reveal a variety of strategies including rainwater harvesting, appropriate site orientation, location for the proposed architecture and an adequate balance between natural preservation and proposed vegetation. Adequate gathering spaces coupled with tranquil walking work together to create a pleasant, pedestrian friendly environment where social meetings are encouraged. The three nodes comprising mixed-use and infill developments ensure maximum public uses integrating open spaces and link the functions through alternative modes of transportation (streetcar, bicycle and pedestrian friendly streets) in the east-west direction offering a continuous urban environment within the city. In an attempt to create a connection with the city center, the master plan suggested in the paper if implemented to the current situation provides possibilities in building up an attractive, sustainable and walkable community that increases social interaction and preserves Tucson's natural landscapes and the rich cultural heritage, discouraging urban sprawl.

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