

Tempering Program

Vincent James and Jennifer Yoos

The Tulane University Center project focused on the problem of reprogramming and renovating a late fifties modernist building and its seemingly implacable programmatic rationale. Using program as a catalyst, the rigidly compartmentalized and hermetically sealed building was reconceived to interact with the continual flux of social activity and climate.

The process of reprogramming and design was interconnected with ideas of how a student center might work as a social instrument at the center of a university campus. Viewing its envelope and mechanical systems as a dynamic interface between social activity and environmental conditions, the student center was redefined at the programmatic level.

"The 1950's Program"

The original University Center was designed around a conventional idea about program and a 1950's set of ideas about student life. The building program was generated with a perfunctory clarity that aggregated bounded and compartmentalized activities. Opaque walls, relentlessly dominating horizontal continuity, further emphasized a typical circulation spine as the central organizing feature of the plan.

The hermetic logic of the original program was paralleled in the uniform treatment of the exterior envelope. Activities were sealed behind glass walls, fixing the boundary between the interior and the exterior, and ensuring full dependency on a "peak load" cooling system. Ironically, the inhabitants appeared to be trapped within an air-conditioned vitrine as they looked out at the often-balmy New Orleans weather.

Later adaptations to the building accommodated the growing student population by increasing the number of inflexible and internally focused spaces, thereby reinforcing the balkanization of the interior. The territorial arrangement of commercial venues exacerbated this fragmentary development. Rooms that were not scheduled for their prescribed activity were left empty and inaccessible. Over time, accessible program spaces fell dark as windows were covered to reduce glare and heat gain. Students complained that there wasn't enough space—but when you walked through the building it was frequently empty.

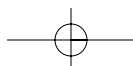
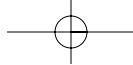
Reconsidering Program

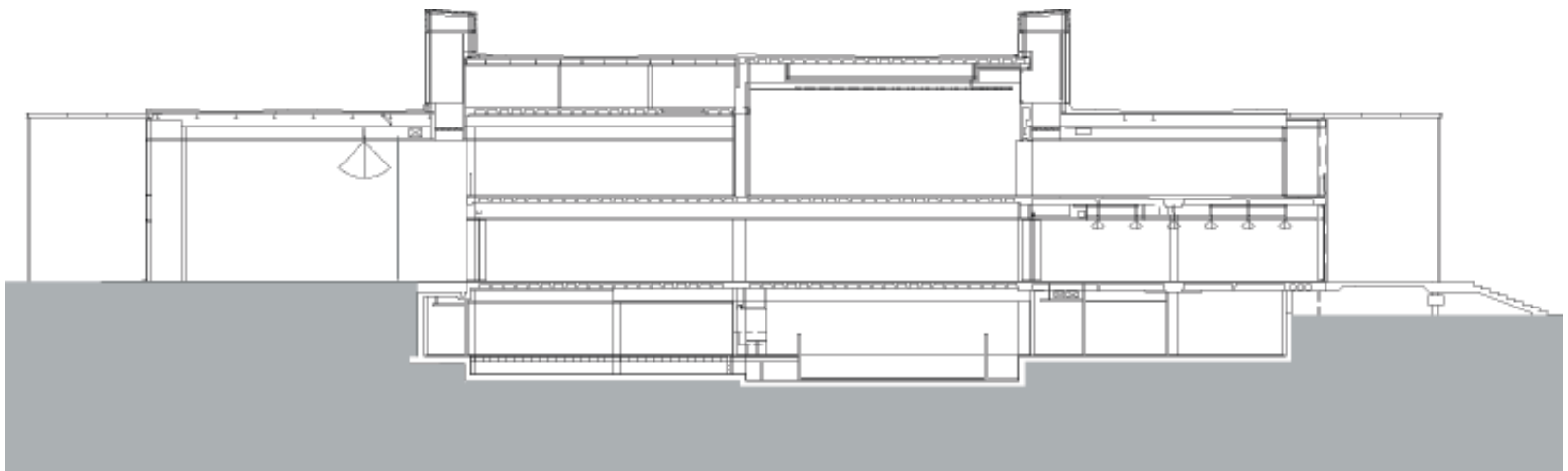
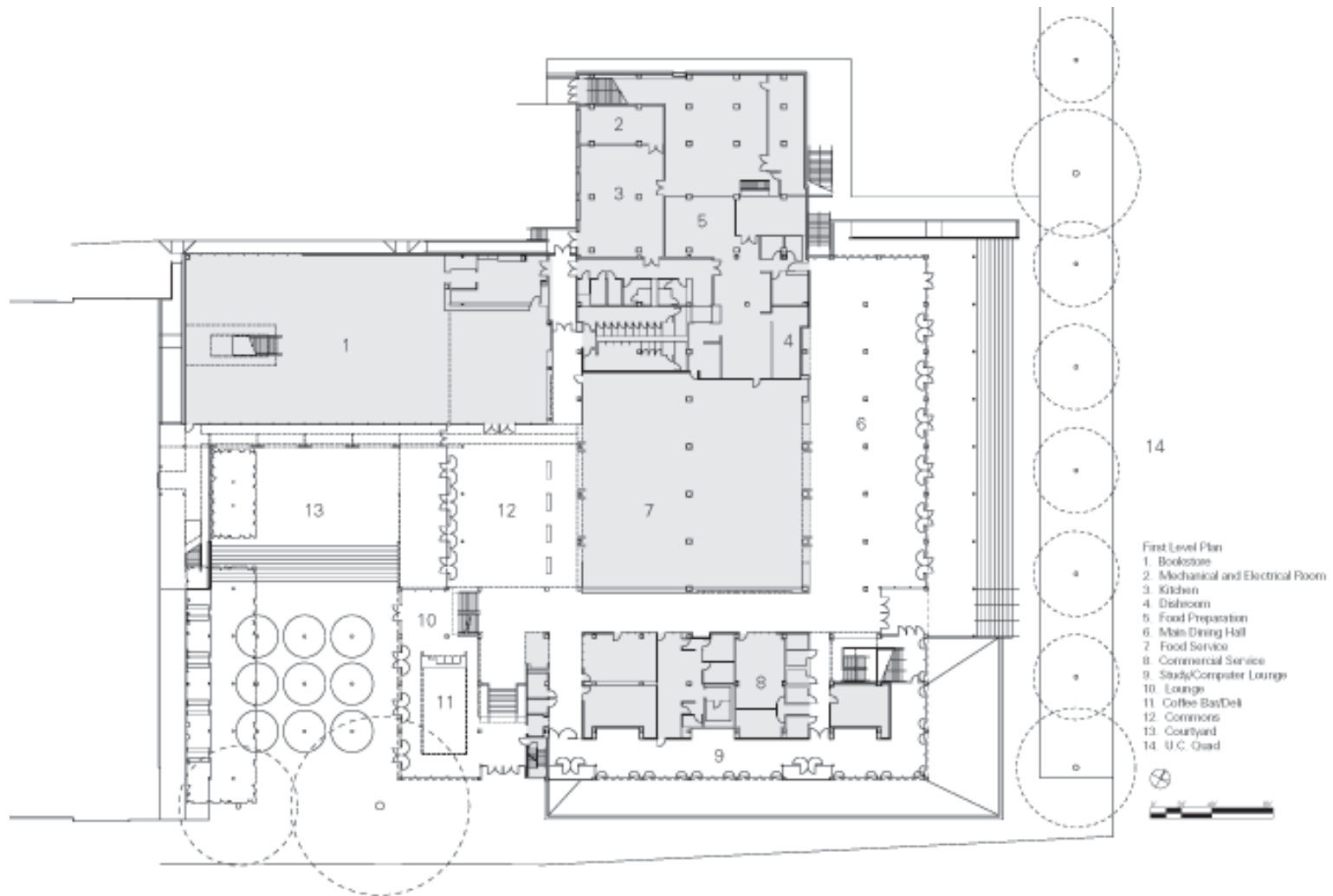
We began with the belief that the DNA of every project is embedded in the assumptions, expectations, and limitations of the initial program brief. The building program is typically seen as a set of prerequisites so transparent and obvious that there is little need to critically examine their assumptions. Briefs are often built on assumptions drawn from other projects without any critique of their origins and little recognition of the complexities of human behavior. The development of the typical program myopically aggregates spaces with rigidly prescriptive uses. Dedicating significant areas to single functions prohibits the programmatic flux that occurs more spontaneously on a campus. As events overlap, unanticipated interactions increase and social boundaries dissolve to create new and unforeseen activities.

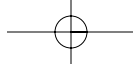
Our design process focused on revealing these dynamic relationships. Many informal activities that occur in a student center, such as studying and socializing, elude simple programmatic classification. In reality, students engage in complex behaviors, often combining activities and appropriating locations unpredictably, relative to changing conditions such as time, season, and microclimates.

Conceptual Models

During the initial research, a range of conceptual models drove the reprogramming of the University Center. Each served as a conceptual tool to critique the prescribed program and expose new opportunities for a more synthetic integration of program, building envelope, and form.







Permeable Membrane

One of the most basic functions of human skin is to mediate between the complex functions of the interior with the variable conditions of the exterior environment. Human skin sweats and the molecules of water evaporate to cool the body. The relationship of the skin to the body is not as simplistic as a single boundary separating the inside and outside. Its mediating function requires complex gradations of porosity across its surface and through its layers.

By forming analogies with the osmotic process in biology, strategies for permeability and programmatic fluidity were used to reframe the program of the University Center project and redesign the building enclosure. The model of the cell enclosed by a porous membrane suggested new ways for architectural surfaces and spaces to adapt to the movement of air, temperature, light and people. Building envelope performance and the overlap and organization of program and circulation were simultaneously reconceived.

The French Quarter Block

In response to the hot and humid climate, architectural forms and spaces have evolved in New Orleans that maximize interstitial space and encourage a more ambiguous distribution of program territory. In a climate where the inhabitants mitigate the heat by moving outside their private domains, simple building devices like balconies, overhangs and porous edges enable a hybridization of social space. A typical French Quarter block contains a dense, but permeable aggregate of buildings. Courtyards admit light, ventilation, and multiple points of entry. Each block resembles a sponge, allowing many ways into the interior. Multiple doors connect closely packed rooms without corridors permitting a continuous and promiscuous configuration of space.

The New University Center

The new University Center project mediates the flux of social interaction through a series of malleable architectural spaces. The building provides distinct microclimates that employ a variety of adaptable enclosures and cooling systems. The spaces are highly flexible and, at the same time, highly specific. Simply put, people either adapt to or change the building depending on local conditions.

Hard and Soft Program

The retained existing structure became an armature from which to reprogram and accommodate varying zones of hard (prescriptive) or soft (spontaneous) program. Areas that are classified as hard program require fixed locations because of needs for security, service, equipment, or thermal conditioning. Examples of these include commercial spaces, food service, the ballroom, conference rooms, and offices.

Areas that are located in between and can accommodate shifting activities were reclassified as soft program. Soft program allows for activities to change over the day and seasons in spaces that can be physically porous and naturally conditioned. This includes activities such as dining, studying, socializing, circulation, and pre-function or break-out spaces. Large areas of soft program on the first level serve as both interior and exterior space and as circulation. Organized as a field of smaller scale elements (kiosks and counters and tables and free-floating volumes), the soft program was distributed to encourage movement and the mixing of activities. Programmatic spaces were also categorized and distributed based on levels of activity and degrees

of social interaction. Exterior paths were adjusted to converge at multiple entry points introducing a series of short cuts and intersecting paths.

Tempering the Program

The building is designed as a series of layered surfaces and spaces that naturally increase in density at the building's edges. This mediating edge is responsive to both the proximal social spaces and the corresponding environmental conditions and orientation. Both the building's exterior skin and its interior surfaces are designed to mitigate light or air or heat gain relative to specific needs of adjacent program spaces. Both hard and soft program space can be tempered in any combination of ways that consider specific functions along with orientation and hours of use. Given the complexity of the building program for the University Center and all of the variations in building occupancy during the day, a universal approach to environmental conditioning was ineffective.

Variable Shading

Early in the project a canopy was developed that defined a rooftop terrace and used varying levels of perforation to shade different types of activity spaces below. More active spaces like the ballroom and terrace were provided more natural light. The canopy was reduced during the course of the project and the additional floor was eliminated.

The idea of a surface programmed with variable levels of shading remained in the project. This strategy was adapted to the vertical exterior surfaces where, relative to orientation, the shading mediated more extreme shifts of solar gain and microclimate with varying functions and hours of use.

A combination of green-walls, louvered exterior shading systems, fritted glass, and overhangs selectively shade and protect from rain torrents. The exterior shading system also reduces incident solar heat gains while allowing significant natural light to penetrate the spaces. These basic shading systems are adapted to become more or less porous depending on orientation and use.

Thermal Zoning

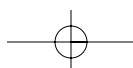
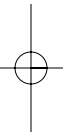
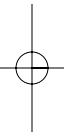
To reduce energy use and expand the comfort zone, operable wall systems, large moving fans, and chilled water walls were strategically used, permitting a variable exchange of air, light, and programmatic activities in areas adjacent to the building skin. Thermal refuge zones at the building's interior core maintain a more constant design temperature of 75 degrees F with 50 percent relative humidity. Higher temperatures at the periphery are made comfortable by the presence of moving air, shade, and cool/radiant surfaces.

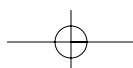
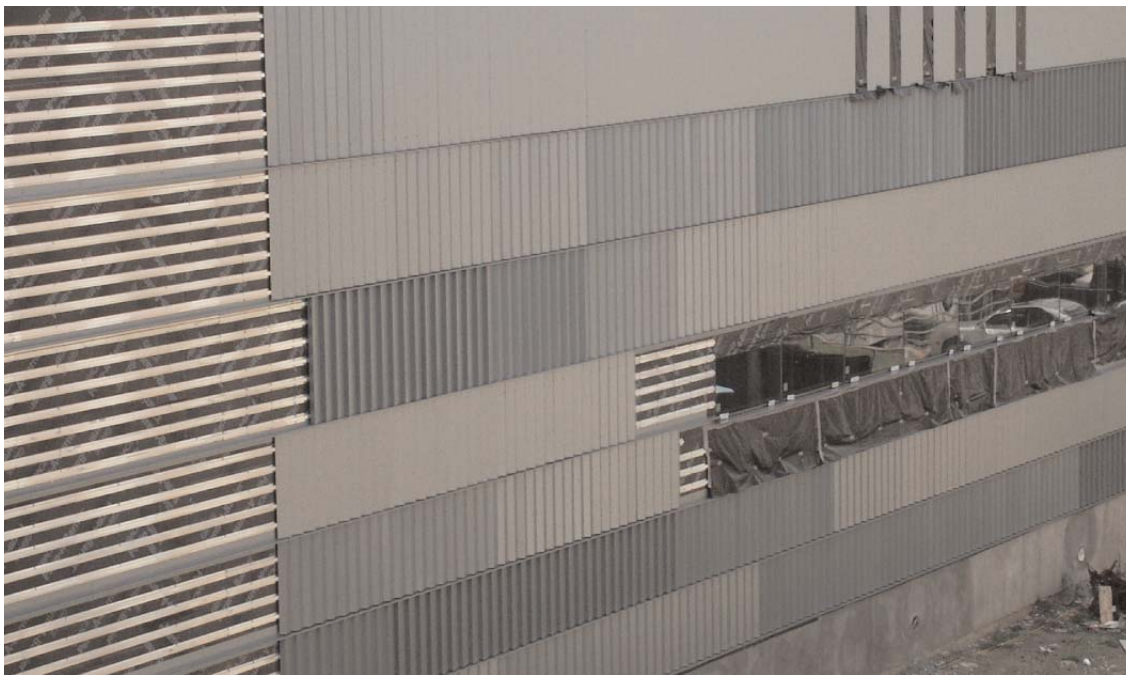
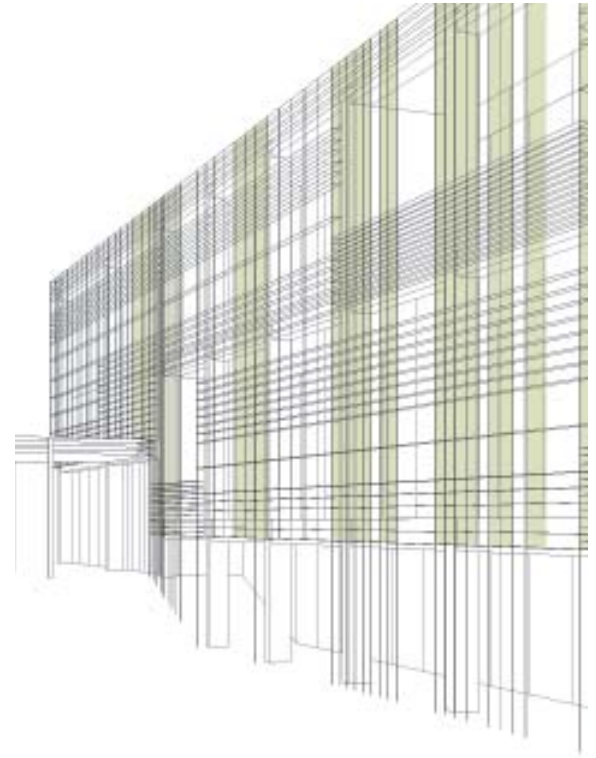
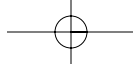
Moving Air

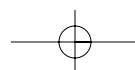
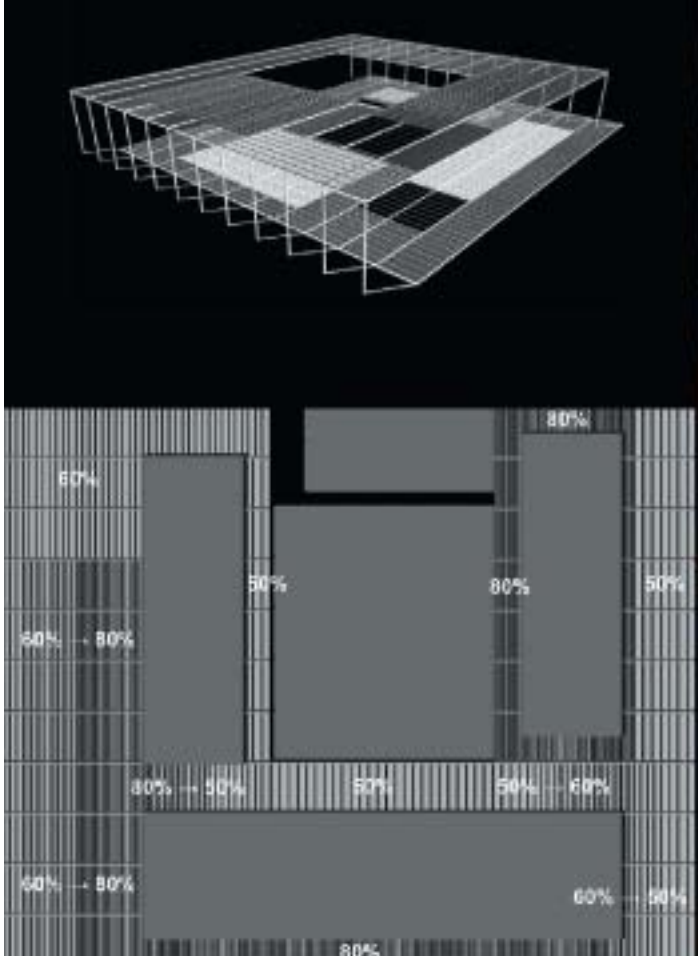
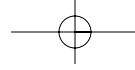
Social gathering spaces along the perimeter of the project are generally supplemented with a variety of mechanical fans that provide local conditioning. Clerestory skylights located on the rooftop introduce solar driven ventilation and light to the center of the building. The speed of movement of fans is also used as an architectural device to enhance the perception of activity in the building.

Expanding the Comfort Zone

While the New Orleans climate is characterized as being hot and humid, there are prolonged periods during the spring and fall months in which daily outdoor conditions fall within the comfort zone of the human body. Simple modifications









to the environment to introduce shade, radiative surfaces and air movement can significantly expand this comfort zone and the number of days the building can remain open. The building membrane adjusts to control climatic extremes, yet provides maximum permeability when interior and exterior conditions are in equilibrium. At times the boundaries of the building disappear as the University Center expands into the surrounding landscape.