# Waterform Building

**Studio:** ARCH 545, Fall 2017
Prof. Martin Felsen

**Studio Summary:** Each student will design a water mobility Hub.
**Site:** Chicago River and Waterfront

Chicago's expansive waterfront includes the shores of Lake Michigan and the banks of the Chicago River. The studio will explore the potential for an innovative new water mobility route linking Chicago's extensive waterfront with Chicago's inland grid. The new water route will be punctuated by "waterform building hubs," which link Chicago's streets (cars, trucks, bicyclists and pedestrians) with a new water-based waterbus, or "vaporetto" transit system. The studio will define new vaporetto routes, consider vaporetto stops in key locations, and design several new architectural centers of activity (hubs) along the new vaporetto routes. The new route and hub mobility network will dramatically expand Chicago's existing water taxi system.



*Chicago Water Taxi*

# 1. Hybrid Case Study project (weeks 1-4)

In an iterative process with key historic projects we will develop a series of design-based scenarios that leverage specific qualities of the city, and will seek to mine these scenarios for their formal possibilities. Formal and spatial invention will be our goal. Projects will be pushed beyond their logical extremes.

First we will speculate on what might have been. To look back at projects of the past and interrogate them for what they might have been. Through a process of collage and montage (old fashioned, but dependable), we will speculate on how the introduction of difference might have changed these projects. The studio will operate in a "slack space" to allow us freedom from the historical and theoretical significance of the key historic projects. For example, we will ask questions such as: What if Superstudio's Continuous Monument had an interior? And, what if Yona Friedman lived in Vegas (instead of Paris)?

Our speculations will not be supported by any hard evidence, nor will they be able to be proven. They will be imaginary and factually questionable. But we will create coherent and precise (graphic) arguments for our speculations. We will develop a formal language. We will pursue multiple possible scenarios, compiling a catalog of speculations.

Although we will look carefully at megastructure projects of the recent past, our references will also include the London Bridge and the Ponte Vecchio. We will appropriate and hybridize. We will play with megabuilding types like mat buildings, wall buildings, and mound buildings.

With the addition of program, we will imagine new forms of collective associations as promised by Modernism. But, whereas Modernism proposed rationality and singularities to deal with the problems and potentials of the city, we will play with irrationality and multiplicities. We will engage density directly. But heeding the predicted future of the "Generic City" in which cities becomes indistinct from one another, this studio will begin with a contrary hypothesis: we will view globalization as reinforcing differences in patterns of localized urban behavior, formal uniqueness and infrastructural specificity.

With the addition of infrastructure, we will posit that architecture and landscape architecture can be both/and — it can be both about growth and about the environment — through the manipulation of form and the tactical deployment of figural systems.

Select one image of an unbuilt project from the list below (or an approved alternate) and analyze it. This is the only information about the project that you need. For example, if you have the following Superstudio Continuous Monument image, this is the entire extent of your knowledge of it. You will invent what you cannot see in the image:

*Superstudio Continuous Monument*

A good way to start is: Ask yourself a series of "What if" questions. For example: What if this Continuous Monument had a section?

Then, invent a section for the Continuous Monument "leg" near the village on the left. Invent a section for the Continuous Monument "leg" that lands in the water on the right. Invent the other two leg sections. Each one can be different, especially as each one has a different relationship with the site. Invent several sections for different parts of the "X" that spans the lake. Think about what might happen under the water line.

As you work, think sectionally. Embed reference forms — like other architectures (embed small buildings from the little village on the left) or other architects. Try really figural shapes. Try programs with extravagant sectional requirements like a scuba diving tank or a theater or a climbing wall. Throw in some "generic" section for some visual relief. Keep going!

Projects to interrogate:

## Walls
Algiers Obus Plan, Le Corbusier, 1931
Continuous Monument, Superstudio, late 1960s
Continuous Monument, Superstudio, early 1970s
Wall City, Kisho Kurokawa, 1960s
Plug-in-City, Archigram, 1964
Exodus of the Voluntary Prisoners of Architecture, Koolhaas & Zenghelis, 1972
Any Metabolist wall project, 1960's and 70's

**Mats**

Tokyo Bay, Kenzo Tange, 1960
Agricultural City, Kisho Kurokawa, 1960
Venice Hospital, Le Corbusier, 1966
No-Stop City, Archizoom, 1970
Ocean City, Kiyonori Kikutake, 1960s
Ville Spatiale, Yona Friedman, 1960s
Free University, Berlin, Candilas, Josic, Woods, Schiedheim, 1960's
Any Metabolist mat project, 1960's and 70's


**Mounds**

Aircraft Carrier Project, Hans Hollein, 1964
Walking City, Archigram, 1964
Artic City, Frei Otto & Kenzo Tange, 1971
Dolphin Embassy, Ant Farm, 1974
Tower of Babel
Any Metabolist mound project, 1960's and 70's


**Geology**

Any geological formation in the Great Lakes Basin (such as cliffs, reefs, rocks, minerals, fossils, or frozen geological or water-based formations)



*First drawing, due Monday, August 28*
*Second drawing, due Wednesday, Sept 06*
*Third drawing, due Monday, Sept 11*
*Fourth drawing, due Monday, Sept 18*

## More details on Hybrids: Landscape/Architecture/Infrastructure/Urbanism

Hybrid Landscape/Architecture/Infrastructure/Urbanisms are design ideas and designed realities that, through nested components and scales, catalyze a larger and more visible public benefit to urban communities. Hybrids are designs that:

- are embedded with added value (multifunctionality, imageability, public benefit),
- represent potential prototypes, adaptable for use in numerous locations,
- are locally self-regulated and controlled (i.e. which "unlock" the grid),
- strategically attract investment and/or generate community stability, and
- generate new sustainability practices.

The studio, and this assignment, will focus on the design of Hybrids and the reciprocal integration of the large-scale building and landscape within this framework. The role of landscape and the environment, with all of its emerging questions of social and performance criteria will underpin the studio.

How can new conceptions of the role of the environment and ecological processes reformulate our ideas of urban infrastructure, programmatic relationships, open space networks, social constructs, and site history? What role can public building play as a vital component to this larger urban framework? Through a multi-scalar and multi-directional approach, students will formulate their own synthetic conceptions of Hybrid Landscape and Architecture.

## What are Hybrids?

*by Javier Mozas*

Hybrids are characterized by a mix of uses together in the same architecture and landscape architecture. Hybrids integrate different programs which also have different developers (public and/or private), managers and users. Relative to users, use times and program, hybrids can be as diverse as a city.

Personality
The personality of the hybrid is a celebration of complexity, diversity and variety of programs. The hybrid is the crucible for a mixture of different interdependent activities.

Each hybrid is a unique creation, often without previous models. The hybrid building emerges from an innovative idea -- which is resolved against the established combination of usual programs -- and bases its reason for existence on the novelty of an approach and the unexpected mixing of functions.

The hybrid is an opportunist building; it takes advantages of multiple skills. The hybrid building looks for unexpectedness, unpredictably, intimate relationships, contextual coexistence, and is conscious that un-programmed situations are the key to the future.

The hybrid can take on multiple personalities and representations, even apparently contradictory representations inherent in architecture, urban landmarks, landscapes or anonymous spaces/objects.

The landmark hybrid is not subject to indifference. It is meant to impact the observer. It does not go unnoticed, but publicly manifests its skills, its extroverted character and its attractive points. The landmark hybrid is a milestone, an actor in a starring role on the urban stage.

The anonymous hybrid, on the contrary, requires each part of the program to lose its uniqueness. If it holds a public program, aspects of its character will dissolve to become a simple secondary actor on the daily stage of the city.

Sociability
The ideal hybrid feeds on the meeting of the private and public spheres. The intimacy of private life and the sociability of public life find anchors of development in the hybrid building.

The permeability of the hybrid makes it accessible to the shared city; and, certain private uses often function 24 hours a day. This means that activity is constant and is not controlled by private or public rhythms. Another use category is created, a full-time building.

Form
The form/function dialectic relationship of a hybrid can be explicit or implicit: one part of the dialectic might lean towards fragmentation, the other toward integration.

A generic hybrid is an undifferentiated building-container that attempts to generically house a diversity of functions and spaces.

The hybrid building will always fight to unite disparate influences that provide life and energy.

Types
The primitive hybrid, or proto-hybrid, has not reached the highest point of integration among its functions and is seen as a set of types that have yet to be fused. One cannot classify hybrid buildings by types -- the very essence of the hybrid is to exist apart from formal categories.

Processes
The mixture of uses within a hybrid is part of its becoming. Property and land development can be hybridized by means of combining public and private development. Structure can be hybridized based on a mix of material (concrete, steel, etc) solutions. Construction can be hybridized with dry assembled elements with wet joints, or the same can be done with prefabrication and traditional assembly methods. Management can be hybridized, with individual and community multi-properties. Landscapes can be hybridized with contrasting fixed and dynamic materials.

Programs

The mixing of uses in a hybrid building generates potential, and protects weaker uses from stronger uses. Hybrid buildings are organisms with multiple interconnected programs, which are both planned and unplanned activities in a city.

Density
Dense environments with land use limitations are good sites to cultivate hybrid situations. The hybrid scheme proposes intense environments of cross fertilization, which mix known genotypes and create genetic allies to improve living conditions and revitalize their surrounding environments.

Scale
Hybrids are small "interventionist urbanisms" such as provisional, informal, guerrilla, insurgent, DIY, hands-on, informal, unsolicited, unplanned, participatory, tactical, micro, and open-source architectures. These hybrids are associated with a scale of modesty, ground-up action and a just do it demeanor.

And, hybrids are associated with a certain form of grandeur, splendor and gigantism, because mixing implies size, and superposition demands height or breadth. The taking over of the surface to extend the program takes up land. It also needs a creative impulse and economic confidence, since it produces new situations inadequate for times of indecision.

The scale of a hybrid and its relationship with the environment is measured by the juxtaposition of programmatic parts.

City
The definition of a hybrid includes urban composition, perspective, grid insertion, and strategic dialogue with other urban landmarks and interrelationships with the surrounding public space.

The hybrid goes beyond the domain of architecture and enters the realm of infrastructure and urban planning.

# **2.** Logistics and Hubs

### Waterfront Network (week 5-6):

The studio will conceptualize an operative matrix for Chicago's waterfront by developing a narrative, visual and conceptual, that defines the most salient issues at play along Chicago's waterfront for an innovative new water mobility route linking Chicago's waterfront with Chicago's inland grid. The new water mobility route will be punctuated by "waterform building hubs," which link Chicago's streets (cars, trucks, bicyclists and pedestrians) with a new water-based waterbus, or "vaporetto" transit system. The studio will define new vaporetto routes, consider vaporetto stops in key locations, and design several new architectural centers of activity (hubs) along the new vaporetto routes. The new route and hub mobility network will dramatically expand Chicago's existing water taxi system.

When developing a waterfront network students should consider a variety of issues which shape the urban environment and impact different "urban economies" such as mobility, energy, ownership, block structure, FAR (floor to area ratio), mobility patterns, architectural qualities, lifestyles, sensorial experiences, etc.

## Hub (week 7-15):

Each student shall choose a Hub along the vaporetto route and design it. Each Hub should address the following four categories:

1.  Access: What are the different modes of transportation and transit that service each Hub (vaporetto stop)? What scales and scopes are these operating within? What are the relationships between public transit and private traffic? What are the existing infrastructure lines (visible and invisible)? Does is make sense for the multiple infrastructures that connect to the Hub site to be adjusted or improved? And if so, what are potential strategies and priorities that can most economically achieve a new set of goals? How can the hubs be conveniently accessed for transportation, social, and commercial activities?

2.  Program: "Millennial Mixer Hub" (as a driver for urban transformation). The "Millennial Mixer Hub" will be the programmatic anchor for a major urban transformation of the Chicago waterfront. Transportation hubs have a long tradition as active agents of change in the city. Each Hub will be a single building, autonomous entity, condensed social network, assemblage of closed and open spaces, nested public/private programs (etc.) that can efficiently serve as the primary backbone of a new urban context. Each Hub will contain a mix of mandatory and chosen programs.

3.  Density: What is the "floor to area" ratio (FAR) of the Hub site? What are the most prevalent programs, forms and geometries at work on the site? Assuming the Hub increases the overall density of the area adjacent to the site, how much more density can the site handle and absorb? How will these density adjustments improve the site?

4.  Footprint: Where should each Millennial Mixer Hub be sited along the Chicago waterfront? Why and how will it work most efficiently? Who will use the site and new programs? Is the Hub producing public and private value for the site? What is the minimum footprint that makes sense on the site? What is the least you can do to make the maximum positive impact on the site? How does the each Hub improve existing infrastructures, and how will these systems need to be transformed to work even better? How will the Hub evolve over time to accommodate future programmatic ambitions and operations?

# Schedule

<u>Week 1</u>: Mon, Aug 28, 2pm
    Hybrids (first drawing due)

<u>Week 2</u>: Wed, Sept 06, 2pm
    Hybrids (second drawing due)

<u>Week 3</u>: Mon, Sept 11, 2pm
    Hybrids (third drawing due)

<u>Week 4</u>: Mon, Sept 18, 2pm
    Hybrids (fourth drawing due)

<u>Week 5-6</u>
### Waterfront Network
New vaporetto routes, vaporetto stops in key locations, and new architectural centers (hubs) of activity along the new vaporetto routes.

<u>Week 7</u>
### Hub Program Diagram

<u>Week 8</u>
### Hub Massing Diagrams/Models
Minimum 3 options

### Mid-Term Review

<u>Week 9</u>
### Hub Section
Drawing includes pedestrian/bike traffic, auto traffic (especially Uber/Lyft drop off and pick up), truck traffic, short term parking, lobby and public hall areas, vaporetto traffic, vaporetto drop off and pick up areas, and vaporetto public spaces, water, underground infrastructure, etc. And, mandatory and chosen program spaces.

<u>Week 10</u>
### Hub Mobility and Infrastructure Plans
Drawing includes pedestrian/bike traffic, auto traffic (especially Uber/Lyft drop off and pick up), truck traffic, short term parking, lobby and public hall areas, vaporetto traffic, vaporetto drop off and pick up areas, and vaporetto public spaces. All ground level, underground level, and water level public/private program spaces.

**Week 11**
### Hub Site Plan
Aerial view

**Week 12**
### Hub Site Axonometric

**Week 13**
### Hub Rendering
View from vaporetto (toward land)

**Week 14**
### Hub Floor Plans

**Week 15**
### Hub Model, scale 1/32" = 1'

**Week 15**
### Final Review

# References

## Waterform Buildings

Allen, Stan, Landform Building, Architecture's New Terrain (Lars Müller Publishers, 2011)

## Ecological Urbanism

Mostafavi, Mohsen. Ecological Urbanism (Baden, Switzerland: Lars Müller Publishing, 2010.)

Steele, James. Ecological Architecture: A Critical History (London, UK: Thames & Hudson, 2005.)

Waldheim, Charles. The Landscape Urbanism Reader (New York: Princeton Architectural Press, 2006.)

Wines, James and Philip Jodidio (ed). Green Architecture: The Art of Architecture in the Age of Ecology (Cologne, Germany: Taschen, 2000.)

## Urbanism

Banham, Reyner. Megastructures: Urban Futures of the Recent Past (London: Thames and Hudson, 1976.)

Koolhaas, Rem and Hans Ulrich Obrist. Project Japan: Metabolism Talks (Cologne: Taschen, 2011.)

Jie, Zhang, The Cultural Gene of Ancient Chinese Space (Beijing: Tsinghua University Press, 2011) in Chinese

Lin, Zhongjie. Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan (New York: Routledge, 2010.)

Shane, David Grahame. Urban Design since 1945 – A Global Perspective (West Sussex, UK: John Wiley and Sons, Ltd., 2011.) Chinese Film:

## Methods & Syllabus

The studio is built on the idea that interdisciplinary collaboration is needed to solve complex problems facing humanity. Engaging stakeholders, users, communities and members of the public in the design process is crucial, as is developing holistic design practices that create robust, long-term solutions. Further, documenting and exhibiting the results of our learning is a top priority. Importantly, the studio will foster systems thinking that aims to reveal patterns through observing, modeling and visualizing complex variables and interdependencies; systems thinking makes tangible the multi-dimensional nature of today's urban challenges. The result of working with these principles will be a rewarding and transformative experience that stretches the boundaries of convention, and grows individual and communal capacities for action. To this end, the studio will emphasize the following practice-based methods:

- Learning in a studio environment where students, faculty, advisors and experts come together to conceptualize, visualize and design.

- Working on real-world challenges with real-world partners, with the potential for global benefits.

- Sharing the findings with the public in meaningful ways.

- Structuring the learning in teams where students, faculty and mentors act as both leaders and followers, sharing their own knowledge and learning from others.

- Assuming a variety of roles on the project and collaborating across boundaries to innovate in design.

- Providing lectures and workshops from local and global leaders that augment overall knowledge and skills and provide critical appraisal and real-time direction and support for project deliverables.

- Receiving feedback from faculty, peers and mentors, to augment a self evaluation process.

- Adopting a "think and do" approach to research combining secondary, primary and applied research methodologies to the design process.

- Following best practices of a real-world studio using design strategy, systems analysis, design briefs, design management and project management tools.


## Syllabus Breakdown

The studio is a combination of short and long-term design-based research projects that connect and overlap throughout the entire year. Charrettes, exhibitions and research trips take place in both semesters. Guest lecturers are also embedded in the curriculum. Government, industry and educational partners support research and design projects in a variety of ways, including participation in events, providing expert guidance, and partnering on the development of projects.

## Schedule (Basic)

This studio will meet three times a week (M/W/F 2 -6pm) in Crown Hall (subject to change). Students will be expected to use time beyond scheduled class time for their field research and design activities. See the studio website for detailed class schedule.

## Course Requirements

1. Complete attendance in all classes is mandatory. Absences must be excused in writing in advance and under special circumstances acceptable to the instructor.

   a. Two unexcused absences will result in the loss of a grade in your grade for the semester.

   b. Three unexcused absences will result in failure of the course. Being accessible to the instructors by working in class is mandatory.

   c. An evaluation of Attendance and Participation is to be made by the instructor based on observation, and feedback from fellow student team members. This will include Attendance and Participation in enrichment activities as required by the course schedule.

   d. Please refrain from listening to or watching non-studio related media during studio meeting times.

   e. Please refrain from non-studio related electronic communications during studio meeting times, i.e. Mobile phone calls, Text Messaging, E-mail, Instant Messaging, Etc.

2. The course will include readings, discussions and assignments. All assignments will be due on time and on designated dates. Late assignments without a valid excuse will lose a letter grade for each day of lateness.  Three days of lateness will result in a failure for that assignment.

3. The application of the above criteria can be avoided if the student has very clear and complete communication with the instructors about work completed and excused absences requested. To communicate outside of studio the student should always call or email the instructor directly and well in advance of class time.

4. The primary means of communication will be through IIT e-mail and class websites. Students are required to check regularly for course updates.

## Grading Criteria

The success of this studio depends on students' self-discipline, willingness to learn and active participation in discussions, and of course, the completion of work that is required to be done outside the class time. Students are expected to be at the studio at least 12 hours each week during scheduled class time and for special events, plus an additional 18 hours (minimum) outside of class time. There will be some required seminar time to become familiar with various issues.  Students may be assigned to work individually or in teams by the instructors. Every student is committed to his/her group and has shared responsibility to that group. Teamwork is essential for this studio, and your teammates may be asked to rate your effort and participation.

All exercises will be due on time and on designated dates. Deadlines for the submission of required work will be announced and must be met. Students are responsible for checking their IIT email daily for class related announcements. Failure to submit work in a timely manner will result in a reduction of your final grade.

Evaluation of your work involves both criticism and grades. Criticism should be understood by students and faculty as a positive means for learning. In all cases, criticism is directed at a project or a process, not at the student who has produced the project. Specific criteria for each project will be determined independently, but may include clarity of Idea/Theme, quality of design concept, quality of oral Presentation, and quality of graphical presentation. General criteria for evaluation will always apply as follows:

1. Concept: Did the student explore and evaluate a range of possible choices before settling on a particular solution? Did the student test various aspects of the solution? Did the student make enough effort to improve/strengthen the solution?  (Concept accounts for approximately 20% of final grade).

2. Craft: Are the ideas correctly and thoroughly communicated? Has the student crafted the drawings and models with care and precision?  (Craft accounts for approximately 50% of final grade).

3. Completion:  Did the student produce all required drawings and models on time and in the required format? (Completion accounts for approximately 30% of final grade).

Letter grades should be interpreted as follows*:

A: Excellent work. Exceeds all criteria. Exhibits insights indicating that the experiences from one phase to the next are cumulative and transferable. Constructively challenges design issues brought forth during the quarter. Demonstrates exceptional enthusiasm and intensity for learning. Demonstrates capacity to be self-critical.

B: Above average work. Performance at the level necessary for a graduate degree.  Meets all criteria. Good understanding of concepts. Constructively challenges design issues brought forth during the quarter. Shows ability in basic critical thinking.

C: Performance below the overall level necessary for a graduate degree.  Meets minimum requirements. Indicates some difficulty in understanding the concepts. Exhibits need for improvement in work habits and Critical thinking skills. Insufficient participation.

D: Below average work. Does not meet minimum requirements. Indicates serious difficulty in understanding concepts. Probable indication of a lack of commitment to the course.

E: Unsatisfactory performance. This grade cannot be used to fulfill a graduate program requirement. If required in a program of study, the course must be repeated.  Late, incomplete, failing, or work not submitted.

* Please refer to graduate bulletin for official IIT university grading policies.

*AMERICANS WITH DISABILITIES (ADA): Reasonable accommodations will be made for students with documented disabilities.  In order to receive accommodations, students must go through the Center for Disability Resources office. The Center for Disability Resources (CDR) is located in Life Sciences Room 218, telephone 312 567.5744 or disabilities@iit.edu*