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UPCOMING ISSUES

Expanding Surface, Issue X, and Urban Matters

Program Primer v 1.0

A Manual for Architects

Brought to you by Dan Wood and Amale Andraos of WORK

Introduction: About the Primer

Program is back! After years of postmodern whimsy, paper architecture, blobs, and countless other formalist tendencies, we have come full circle back to good old form that originates in function. Or have we? In buildings such as the Seattle Public Library a new, broader definition of “function” has given rise to an unbelievable array of spatial configurations and formal expressions. This more inclusive definition of the architectural program encompasses ecological concerns, cross-disciplinary collaborations, new technologies and virtual spaces, exploitation of the temporal and seasonal, and any number of combinations, juxtapositions, manipulations, and reinventions of the simple list of spaces and areas that heretofore bore its name.

Many architects today are interested in incorporating this new approach into their designs, but are unsure about how to do it. After years of toiling away on napkin sketches and then looking for inspiration in the beautiful crumple of the rejects, it is understandably difficult to set aside your self-image as an *artiste* and start designing by Excel. This Primer will help you get started with a simple series of exercises and examples designed to open up your mind to the new possibilities for creative expression through programmatic exploration. In no time, you will find yourself doodling diagrams and graphs and—hopefully—creating the next generation of masterworks that combine both programmatic variation and formal elegance.

How this Primer is organized:

- + Program Basics
- + Program Exercises
- + Beyond Architectural Tools
- + Ten Changes You Can Expect from Program



Program Basics

1. The Definition of Program

The traditional definition of the program is “the formal, written instructions from the client to the architect, setting out the necessary requirements for a building.” For our purposes, we are interested in expanding that definition to include the informal and the unwritten as well as alternate sources of “requirements”: from mechanical and structural engineers to artists, technology experts, consultants, authors, users, builders, and—most importantly—the architect. By thinking creatively about certain *performative* requirements for architecture, and through careful and clever manipulation of the input of all of the other interested parties, the architect can actively participate in the redefinition of program every time a project is begun.

2. The Evolution of Program (see John McMorrough, “Notes on the Adaptive Reuse of Program,” p. 102-110)

3. The Eight Great Principles of Program

- + **Diagram** The generation of strong concepts—simple enough to incorporate the huge number of complex relationships that exist in every architectural project—through the drawn, written, or spoken “diagram”: a quantitative and qualitative means of expressing a set of spatial relations and describing experiential needs without any overt reference to form, using only iconic elements, words, or numbers.
- + **Shuffling** The utilization of architects’ capacity for complex mental manipulation of three-dimensional space to shuffle and recombine programmatic elements instead. What used to be called “deconstructing” can be utilized as a critical reading of program where parts are omitted, others are recombined, new parts are created, relationships are broken, and others established.
- + **Sampling** The ability to insert events, expertise, technologies, and programs outside the common field of architecture into a project.
- + **BreakBeat** A non-linear approach to design where “this” does not necessarily follow “that”; one that embraces uncertainties, clash, and the unexpected.

- + **Critical Distance** Maintaining the energy and discipline required to reimagine, reinvent, and recombine elements of the client’s program, no matter how detailed, boring, or complete the document they hand you seems.
- + **Range of Motion** Finding potentially interesting aspects of a project unaddressed in the client’s official program and making them integral to the project.
- + **Flow** The ability to quickly switch back and forth between the quantitative aspects of a program and the qualitative ones, identifying and finding the potential for synergy between the two.
- + **Opposition** The staging of disparate elements towards the formulation of a concept: adjacency tensions, negative/positive, three-dimensional figure-grounds, power relationships, etc.
- + **Dieting** Weeding through the reams and reams of a written program in order to find the essential kernels of use, activity, performance, or function that will transform an ordinary building into a lean, program-driven machine.

4. What You Need To Get Started

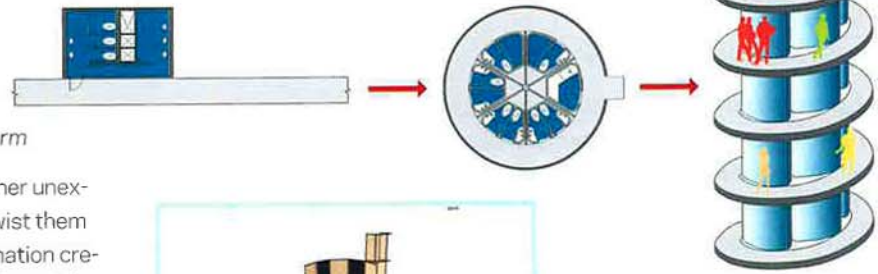
- + **Pentel sign pens or sharpie markers** Throw out those fine liners; programmatic expression is about clear concepts and integrating the quantitative. A broad pen aids in this broad-brush approach.
- + **Plain paper** If you are going to have fresh ideas, why trace over something old? Put those rolls away.
- + **Model-making materials** In the end, we are creating three-dimensional space. Working with diagrams, graphs, lists, and charts can sometimes allow you to get carried away. By immediately and often translating your programmatic ideas into spatial ideas, you will never lose sight of the goal.
- + **A project** This is up to you. Go get one!
- + **And some imagination** Make that a lot. Never underestimate the power of a good idea.

Program Exercises

The Twist

Combining two or more programs in a single form

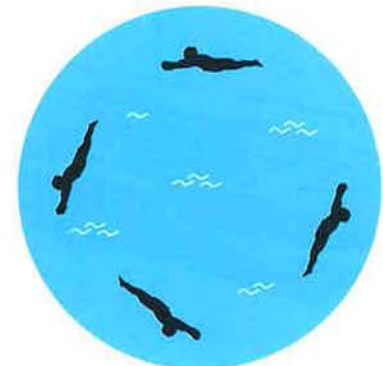
Take two programs whose co-dependency is either unexpected or so unquestioned as to be banal and twist them together in such a way that the resultant combination creates an entirely new sequential experience and form. Like Mr. Softee's chocolate-vanilla swirl, the excitement is in the combination, and how it was achieved, rather than the fact that you now have two flavors in your cone. Nicholas Grimshaw's first project, a tower of bathrooms for a student hostel in a group of buildings without plumbing, is such a project. The pre-fabricated WC and shower units are arranged around a spiral ramp that accesses each floor. The genius of the solution is in this ramp. It creates—through what on the surface appears to be purely functional means—an incredible social space for the hostel. Student residents, in their search up or down for an available unit, encounter other students from other floors and are almost forced to interact. The fact that most are in their bathrobes makes an already-charged atmosphere even more so...



The Square Tomato

Creating new forms for programs

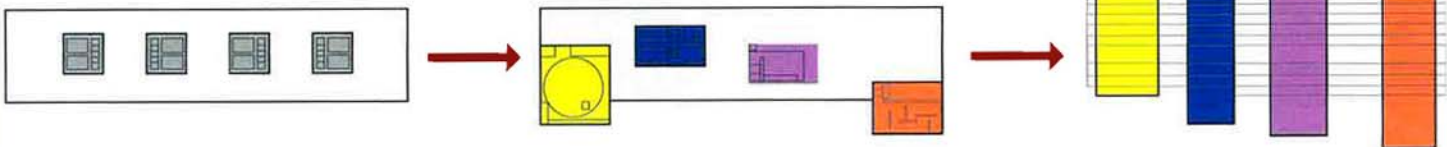
An Italian engineer realized that shipping tomatoes was a tricky business, with a lot of wasted product. His solution was to grow them within boxes, creating perfect cubes for easy stacking and shipping. Never mind that people did not want to eat square tomatoes—they did pack like a dream. Any form can be reinvented and improved. Try to rethink form from a programmatic perspective and the results can be revolutionary. PLOT's design for a municipal swimming pool is a case in point. Their circular design not only provided for an exciting building, it also allowed for continuous lane swimming by running the main lap pool around the perimeter. No more bumping into that lady in the flowered bathing cap as she tries to execute the perfect turn off the wall...



Pearl in the Oyster

Play between the generic and the specific

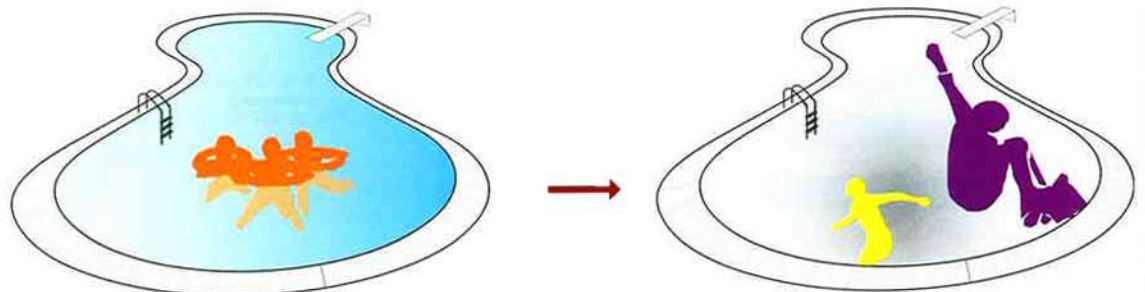
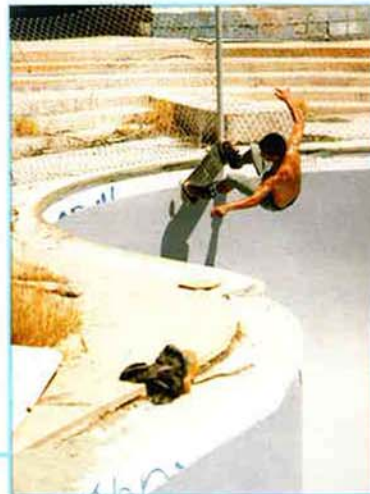
Many buildings and projects feature repetitious spaces or large areas of space where the opportunities for architectural expression are limited. By searching out areas of specificity and exploiting them strategically within the expanse of generic program, the interplay between the generic and the specific can create interesting and dramatic tension. OMA's Universal Building employed this strategy at an enormous scale by concentrating not only all of the "ugly duckling" specificities (see "The Swan" p.114) of risers, elevators, emergency stairs, etc. within four enormous cores, but also by including all the architecturally interesting spaces there as well: double-height "lofts," courtyards, meeting rooms, executive suites, etc. The bulk of the building, generated through research into the most efficient office planning modules and requirements, was left open as a horizontal plane; the four "towers" of specific program cut through this plane to provide vertical architectonic relief from potential corporate monotony.



The Time Share

Different uses at different times in the same place

Find ways to exploit uses which do not overlap in time; spaces can be used for different things during the night and the day, from one season to the next, or periodically throughout a single day. Universal space, the dream of the modernists, does not have to be so ponderous and empty—think of the high school gymnasium that sponsors dodgeball as well as commencement, the holiday pageant at night, and mystery meats in the afternoon. The most innocuous coincidences of time can sometimes be exploited to create enormous cultural change. The longest drought in LA history, the invention of new types of resin plastics for wheels earlier that year, and a small gang of disaffected surfers, all came together in a series of dry pools one summer to change sports, fashion, and the face of teenage cool forever.

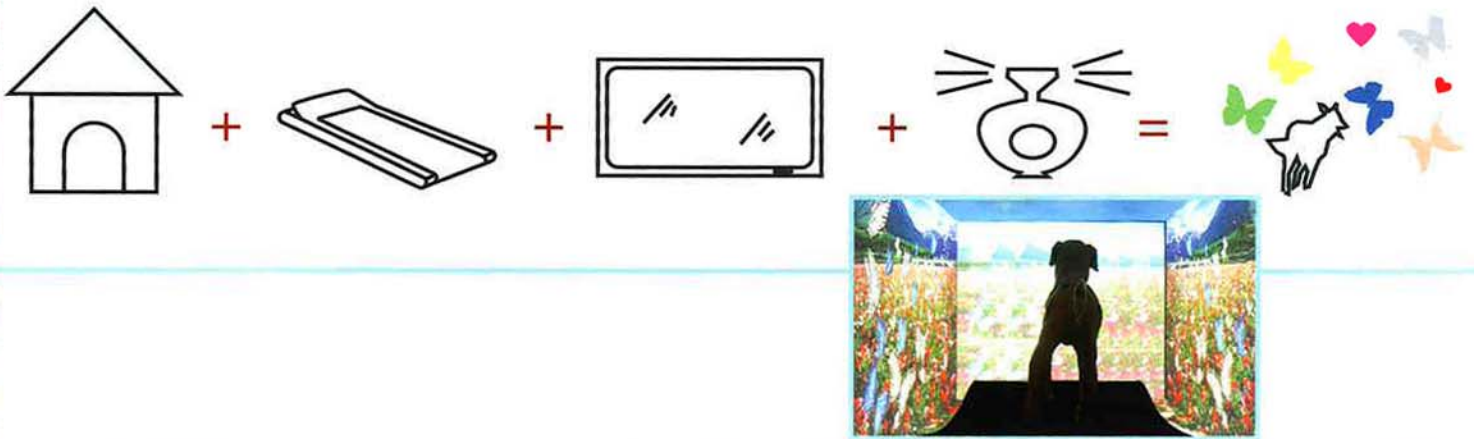




The Better Mouse Trap

Re-thinking the ordinary

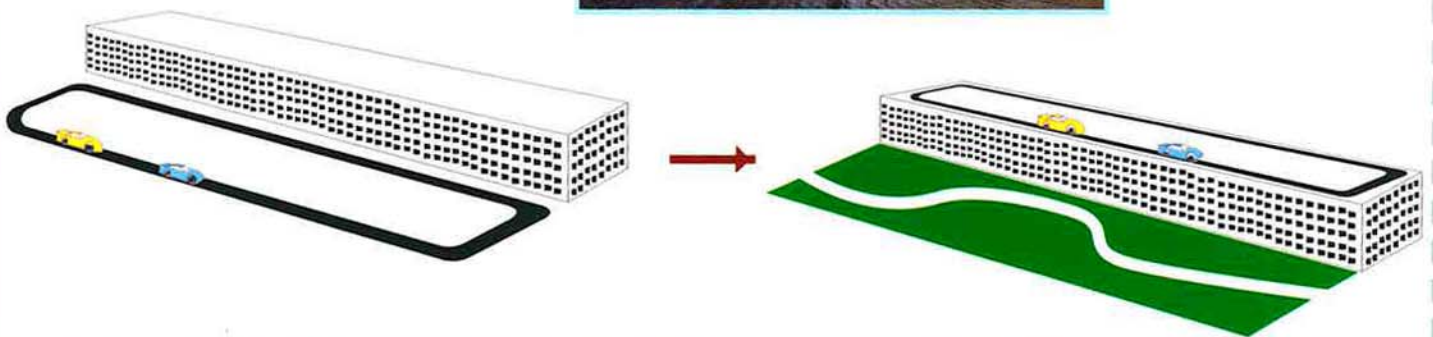
Sometimes it is worthwhile to take the plunge and simply reinvent something no one had previously considered worthy of reinvention. A healthy degree of skepticism that everything that can be invented has been invented is necessary. To be a good program-driven architect, you must be able to imagine yourself in the shoes of your client or the people who will inhabit your building and re-imagine the ways that spaces can accommodate activity. In our own work, we have tried to do this even when our clients do not wear shoes. The Villa Pup was a commission for a doghouse wherein we tried to imagine the ultimate home for the “urban dog.” A combination of treadmill, video screens, and an odor machine allowed the urban dog to experience some of the prosaic canine joys of its rural cousins—chasing mailmen, Frisbee tossing, barking at cats—during the long days cooped up in the apartment. Other scenarios included boosting the urban dog’s self-esteem—the Chihuahua racing the greyhounds, for example, and winning.



Simile

One program defining another

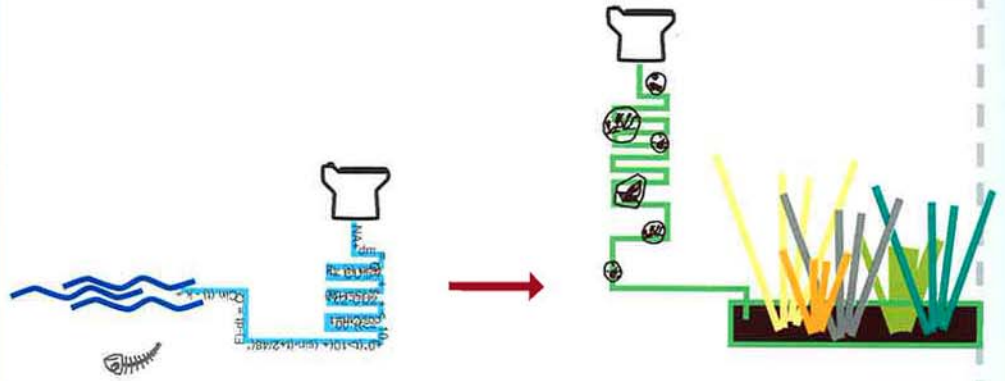
If something looks just like something else, or reminds you of something else, maybe it could be something else. Use a program, or an entire project, to define another in an efficient and architecturally-scaled metaphor. Someone was smart enough to note that, "hey—this new Fiat factory is going to be as big as the testing track" (or noted that the testing track was as long as the factory) and architectural history was made.



The Swan

Beautifying the banal

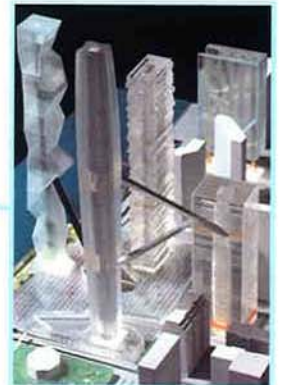
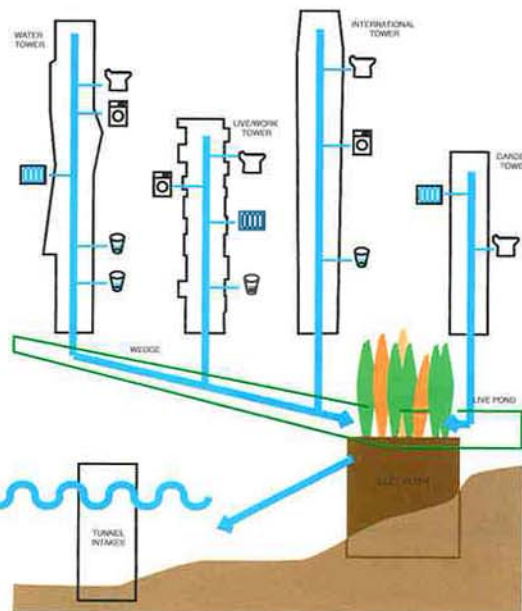
Architecture is full of ugly ducklings. There is vast un-mined potential in air conditioning ducts, grease traps, boiler rooms, and the like. Take the most unbelievably boring, maudlin, or ugly program and try to re-conceptualize it as something beautiful, productive, or inspiring. Artist Joep van Lieshout's "Total Faecal Solution," for example, tries to maximize the benefits and aesthetic potential in the most base of human activities. A toilet is set high enough off the ground to incorporate a collection tank below. Methane gas is siphoned off, water is filtered to the point of potability, waste is compacted, and compost is created. An adjacent garden and strategically placed portholes provide evidence of the process. The resultant structure—in van Lieshout's trademark style—is both visually arresting and strangely beautiful. It becomes a true shrine to human waste...and human responsibility.



The Wedge of Swans

Take the Swan and scale it up

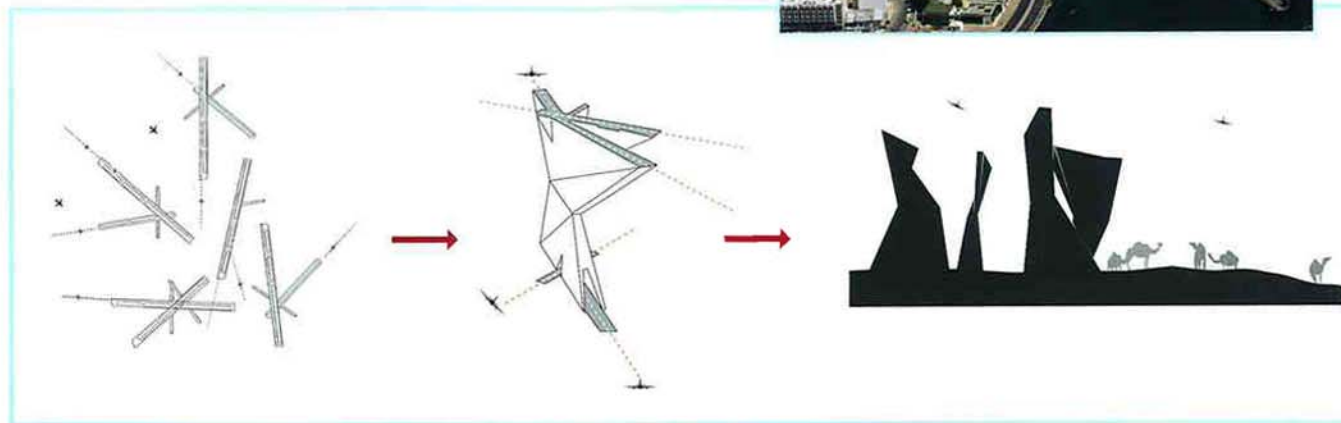
Making beauty from detritus is even more challenging at the large scale, but can also create amazing opportunities for spatial and programmatic experimentation. In the competition for "un-city," a huge development in New York, the team of OMA, Toyo Ito, Davis Brody Bond, 2x4, and KPF teamed up with D.I.R.T. Studio's Julie Bargman to try to imagine an ecologically sensitive/celebrative two million sq ft development. The result—with grey water recycling running alongside ten-story escalators, a permeable asphalt parking structure, and an atrium combined with "inlet" to cleanse water from the development and the East River—was, in the end, too much for the competition sponsors to take. Unfortunately.



The Dive

Using a program to generate a single swooping form

It is somewhat of a rule for those of us not named Frank Gehry that the strange shapes you can imagine are never as exciting as the strange shapes you find, often in the most unlikely of places. Form that is derived from program often outshines even the blobbiest of blobs. In their theoretical project for Dubai, L.E.F.T proposes three high-rises in the midst of the desert whose forms are entirely driven by the program they have chosen for the future of Dubai: landing for international planes. The extruded and twisted runway patterns—taken from actual airport runway designs—create stunning forms in the desert.



Distribution of Wealth

Maximizing the effects of the best programs

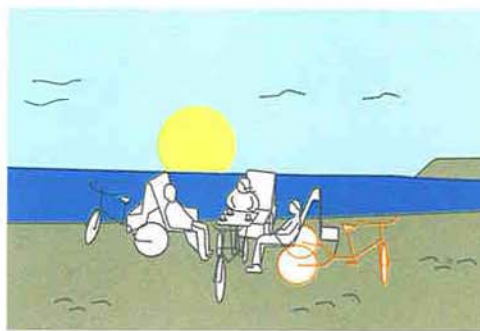
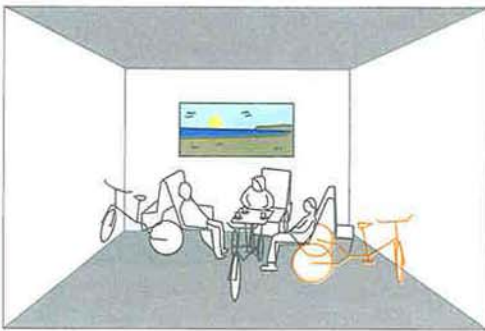
Many buildings are primarily composed of repetitious elements that can overwhelm the more interesting parts of the program. By sprinkling these interesting spaces throughout the building, however, every repeating floor or room can be energized with a new activity. In their Hotel Pro Forma project, nArchitects appropriated the most public and exciting part of the hotel program—the lobby—and distributed it equally in between every floor, creating an alternating section of bedroom floor / lobby floor diagram which brings the excitement of a public lobby to every bedroom floor.



The Mermaid

Juxtaposition of unlikely programs towards a surrealist experience

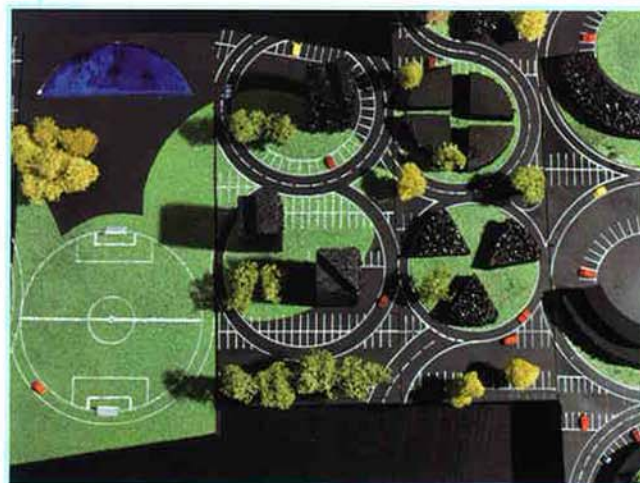
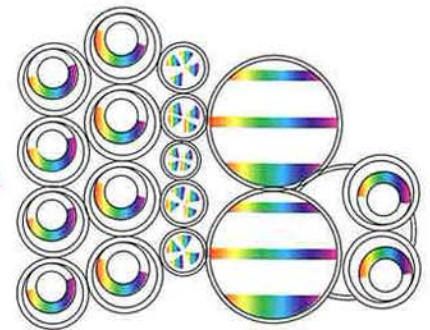
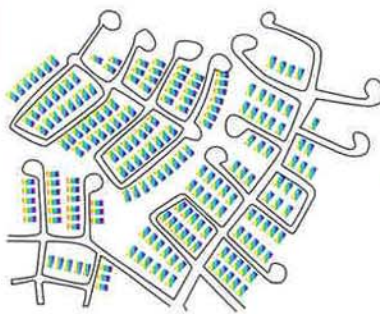
Mythology is filled with lasting images of strange combinations: the centaur, the hippogriff, etc. The surrealists picked up on this and the "surrealist object"—the unexpected element—became central to their philosophy. Simply placing one program in the context of another can create extremely interesting conditions. Most of Atelier Bow-Wow's work—both built and in the form of books—is a play on the Mermaid. In their guidebook, 'Made in Tokyo', the group records the surrealist urban objects of Tokyo. All of the buildings are described in terms of an additive equation of unrelated parts: 'Vampire Park' = public square + donation park; 'Royal Golf Apartments' = 'royal host' chain restaurants + golf practice range + apartment building + car parking, etc. In their Furnicycles project, Atelier Bow-Wow adds a different household furniture element to a series of bicycles, allowing for a small group of riders to come together and create an entire house.



Roll Out

Repeating a single program over and over with subtle variations

The architect's version of "staying on message" can at times be as effective as it is for our politicians. Sometimes a brilliant idea is best expressed through repetition. This repetition is often most sublime when it is doggedly pursued through the stages of monotony, boredom, and ad nauseum to a point where its power cannot be denied. In One Architecture's planning project for Judenburg-West, they discovered that, in Europe, significant subsidies exist for introducing much safer traffic circles, rather than intersections, as connectors for new residential districts. These subsidies in fact outweigh the costs of construction, allowing developers to use the money to introduce things like old-age housing, public facilities, and the like. One's natural reaction was therefore to create a plan whose driving concept was to introduce as many traffic circles as possible, finding a number of ingenious ways to occupy their centers and peripheries.



Bondage

Using budget or other constraints as programs in their own right

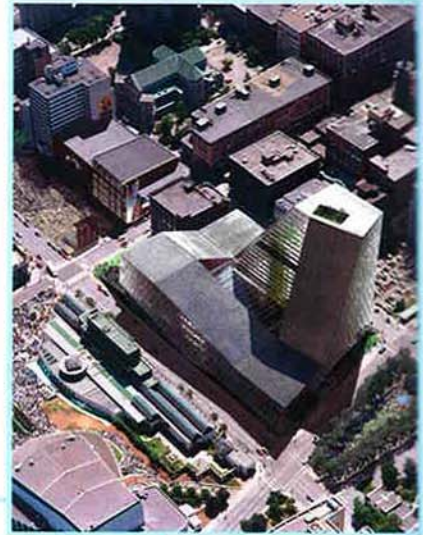
"Creativity" in architectural practice often seems like a technical impossibility. Between building and zoning codes, client insecurities, budgets created by dreamers, rigid requirements for adjacencies and hierarchies, the limitations of construction and contractors, and the simple tendency of everything to head inevitably towards that lowest common denominator, it is often difficult to come up with any ideas that can get built. Since the best defense is often a good offense, one of the main tactics of program-based architecture is to use these constraints as the departure point for design. In our project for a residential tower in Beirut we quickly realized that—contrary to almost everything else in the city—the building rules were incredibly constricting: the zoning envelope forced the building to sit at the very back of the site, away from any possible views of the Mediterranean; every room required either a "primary" or "secondary" view with strict definitions; balconies were mandated, etc. Our solution consisted of building our "ideal" building, facing directly towards the sea, until the point at which the zoning envelope cut in, and then sitting the mandated building on top, creating a building whose fifth and sixth floors were more desirable than its seventh and eighth and allowing our clients to maximize their profits in the what are usually the least desirable lower floors.



The Blind Men and the Elephant

Different faces can define a single form

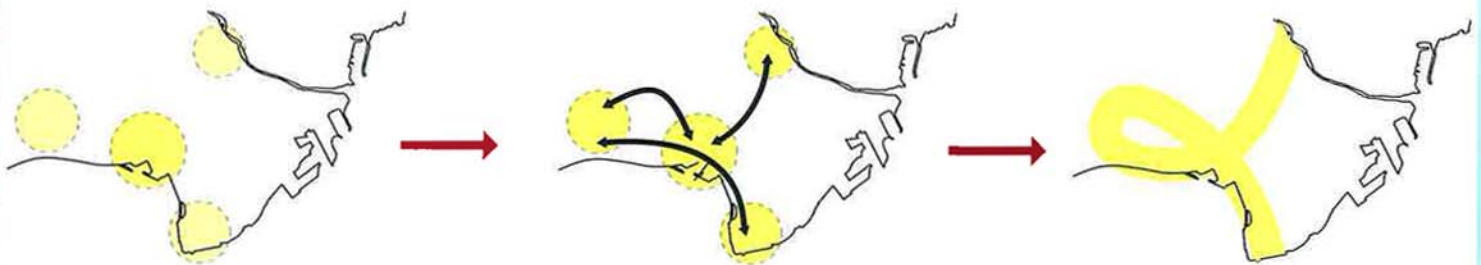
Complex agglomerations of program can present a unique challenge, especially in buildings that need to contain and present multiple identities to the world. The trick is to exploit this multiplicity while retaining harmony and identity in order to avoid a kind of schizophrenic pastiche. In our competition entry for the new Montreal Cultural and Administrative Complex we combined Montreal's long love affair with the mega-structure with the stated desire that the disparate occupants of the building all retain their unique identities: the Provincial Government, a school for the performing arts, and the main concert hall of the city. Uniqueness was created by establishing different entrances and conditions for the three programs, each one facing a street appropriate to its program. (The concert hall entered from a grand boulevard, the school from the hip shopping street, and the administrative tower discretely from a side street.) To provide an overall concept, the program was laid out in three parallel bands that were then combined into a continuous ring of program around the building's new centerpiece, the glass-roofed concert hall.



Fusion

Creating power through fusing disparate elements together

While gourmet chefs and minimalists may disagree, a lot of excitement and activity can be generated through the introduction of many different ingredients to a project and fusing them together with a common thread. In our competition project for a new plan for the sleepy town of Akureyri, Iceland, we created a continuous pedestrian loop connecting the main sights of the city. We then infused the loop with three programs: density, the introduction of new housing typologies based on density of units; activity, a series of paths and routes allowing people to ice skate, walk, rollerblade, kayak, jog, swim, or ski around the loop; and ecology, a series of green spaces "curated" by the city's botanical garden plus a loop-wide concentration of alternate energy sources, from wind-powered streetlights to solar collectors.



Beyond Architectural Tools: Equipment and Accessories

+ Foam Never Felt so Good: the Foam Cutter

The hot wire foam cutter allows even the youngest intern to crank out an unending stream of architectonic concepts within an extremely short time. Its power is awesome, allowing any idea to be immediately expressed in three-dimensional form, cheaply and efficiently. Have you noticed that European architecture these days is a little more daring and expressive? It's no coincidence that there is not a single good manufacturer of small hot-wire foam cutters in the US.

+ Abracadabra: Design by Excel

It's not just for MBA's anymore. Not only can a mastery of Excel help break the ice with your developer clients (and don't be afraid to ask for tips, those guys are spreadsheet kings) it can also aid immensely in the abstraction of program and the rapid manipulation of sizes, adjacencies, and distribution. It can help manage your fees as well.

+ Size Does Matter: Expanding and Contracting Program with AutoCAD

Budget cuts getting you down? Try "scale all 98%" to your program diagrams to effect an across the board value engineering coup. Things not exciting enough? Selectively beef up certain programs while slimming others; the difference will only be noticeable in the improved quality of the finished product. The "Stretch" command is also handy.

+ For Help Doing the Exotic Stuff

Don't be afraid to call in experts, especially people who are not architects. You would be amazed at how inspiring a theoretical discussion with a mechanical engineer can be...no one has asked them anything except vent locations and shaft sizes for years.

Ten Changes You Can Expect From Programmatic Design

+ A Firmer and Leaner Project

You'll be amazed how your project sails through client reviews, value engineering, and approvals processes once it has been imbued with a strong and simple programmatic concept.

+ Better Posture

You'll be able to better defend your positions when others can easily understand the ideas you want to express in your architecture.

+ More Flexibility

If you start a project by creatively reimagining its programmatic elements, it becomes easy to quickly do so throughout the process as unexpected problems or conditions arise.

+ Better Balance

Weighing options and variations eventually becomes second nature and you will find your decision making abilities streamlined.

+ Less Back Pain

By cross-training—moving from Excel to the foam cutter to AutoCAD to meetings outside the office—you will find less strain on your body.

+ New Friends

Eventually you will find yourself surrounded by non-architect friends and colleagues. You'll find them much less intimidating than you once imagined.

+ Social Skills

Instead of peppering your conversations with vague architecture-speak, working with real world programmatic elements will give you a broad range of new subjects to talk about.

+ Staying Power

If you are able to convince your client of the strength of your concept, you will be surprised at the amount of ideas that will remain in the project until the end.

+ More Fun

Admit it, it is more enjoyable to read a well-crafted story than poetry...you know it.

+ More Profit

Just kidding...you're still an architect!

